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*Illustrated.

BEFORE the full opinion of the Supreme Court in the Kansas City Southern case was available it seemed possible that notwithstanding the fact that the court had decided against the railroad, there might be, as there so often is in the Supreme Court's decisions, something within the case itself on which the court had based its decision without passing irrevocably on the general principles involved. The full opinion puts an end to any such hope if it had been entertained. The court in unmistakably clear language holds that the Interstate Commerce Commission is fully within its power when it orders railroad companies to charge to expenses the cost of property abandoned when the cost of replacement is charged to property account. The court finds no merit in the railroad companies' contention that by permitting the abandonment of property vertically and refusing to permit it laterally, the commission is abusing the authority with which it is clothed. The court makes no attempt to minimize the great importance of the distinction between expenses of operation and additional investment in the property and makes it unquestionably clear that not only has the Interstate Commerce Commission full authority to prescribe the manner in which this distinction shall be made, but quite plainly sets the seal of its own approval on the method of dealing with abandoned property which the commission has adopted against the advice of many of the members of the Association of American Railway Accounting Officers.

THE tentative classification of revenues and expenses which the commission has recently sent to railroad companies for their discussion provides for depreciation for every class of material used in the maintenance of way and structures. The Supreme Court's decision in the Kansas City Southern case would appear to suggest that if the commission requires depreciation charges against roadway and track it will be following the Supreme Court's theories of sound accounting. The court says:

> The contention of the appellant that property originally acquired because necessary in the construction of the road and afterwards abandoned only because rendered unnecessary by the improvement and development of the property should remain in the property account as a part of the stockholder's investment, will be found upon analysis to rest upon the unwarrantable assumption that all capital expenditures result in permanent accretions to the property of the company. This in effect ignores depreciation —an inevitable fact that no system of accounts can properly ignore. A more complete depreciation than that which is represented by a part of the original plant that, through destruction or obsolescence, has actually perished as useful property it would be difficult to imagine. . . . The real question is not how shall original cost be ascertained, but how shall subsequent depreciation in value be reckoned and accounted for.

There is one thing about the Kansas City Southern decision besides its definiteness that is to be welcomed. It is the clear pointing out that cost of progress is a burden on earnings, and it follows that earnings must be sufficient to pay for the cost of progress if we are to have progress.

"MY father chastised you with whips but I will chastise you with scorpions." This reply of young King Rehoboam to the people of Israel when he succeeded to the throne of Solomon will occur to railroad men when they read the changes in the parcel post rates. The railroads humbly asked for relief from the burden of carrying parcels for the post office department without compensation; and the reply of the government is an order raising the weight limit for packages from 20 lb. to 50 lb. when carried only in the first two zones, and from 11 lb. to 20 lb. for all other shipments. It is estimated that the business transferred from the express cars, where the railroad would receive pay for its service, to the mail cars, where it will receive no pay (until Congress sees fit to take action), will by this order be doubled. The order goes into effect January 1. The postmaster general agrees to ask Congress to adopt reasonable rates for the compensation of the railroads for carrying the mail; but Congress has a well-known habit of complying with such requests when it gets ready—usually after a delay of many months or years. After reading of the utter indifference of Congress to the appeals which have been made to it on behalf of the railways since the parcel post law was adopted, one is disposed to class the postmaster general's promises as trifles light as air. The latest outgiving from the government concerning mail pay is a statement charging that the rate paid for the use of postal cars is exorbitant; and on the strength of this a bill has been introduced in Congress to enable the government to own these cars. To congressmen who desire to see the government extend its activities in any and every

direction, this bill may seem reasonable; but it is difficult to see how any one else can so consider it. Mr. Peters has answered the charge of excessive pay, in a statement printed elsewhere in this paper. On short mail cars no rent at all is paid. But, whatever may be the equities, changing the ownership of the cars helps nothing; for all that the railways expect is a fair price for services and risks, and a fair interest on their investment.

IN spite of the fact that many men disagree with James E. Howard in his oft repeated conclusion that the cause of the recent frequent appearance of transverse fissures in rails is the overloading of the rails, he has railway men on the defensive when they attempt to prove him wrong. Mr. Howard follows up this advantage with an appeal for a thorough study of the stresses existing in track, based on actual tests rather than analytical deductions. Several thorough studies of this subject have been made from the theoretical standpoint and at present studies of this nature are the only ones possible as little accurate data of actual stresses have ever been collected. No other engineering structure is based so largely on experience without engineering design as is track construction. The primary reason for this is the presence of so many indeterminate factors, such as the character of subgrade, ballast, climatic influences, etc., which can be eliminated only by a very extensive series of experiments under a wide variety of conditions. At the same time, in view of the importance which the rail problem has assumed, a study of the stresses to which a rail is subjected would appear to possess equal importance with the study of the proper manufacture of rails which the American Railway Engineering Association is now investigating so thoroughly. It is fortunate therefore that the American Society of Civil Engineers and the American Railway Engineering Association are now arranging for the appointment of a joint committee of the two associations to undertake an exhaustive study of this kind and that sufficient funds are available for experimental work. It is to be hoped that the roads will extend all assistance possible to this committee in this important work.

THE Massachusetts Public Service Commission requires the Boston & Maine to spend $373,873 for interlocking signals, at a time when the company's net receipts are so low that its financial health is in a precarious condition. The decision was briefly noticed November 28. The absolute order applies to only one interlocking, but the "recommendation"—which, under the new law, is about the same as a command—applies to all places where the old ball signals are in use. This action of the commission appears to be equivalent to a disapproval of low speeds, for the old ball signals have been used with safety for many years—by limiting the speeds of all trains at places where these signals must be observed. Now, whether the road has the money or not, it must provide facilities for higher speeds. Interlocking switches and signals are the only right kind at junctions and crossings on first-class passenger railroads, and this paragraph is not written for the purpose of approving any but the right kind of signals; but it is a very crude and short-sighted policy on the part of a state to compel a road on the verge of financial failure to make costly improvements which are needed only because commissioners, having no financial responsibility, set up standards which have not been intelligently and conservatively compared with the actual conditions which have to be met. The Boston & Maine has spent hundreds of thousands of dollars for automatic block signals. It may have made a mistake in spending too much in that direction and too little for interlocking at junctions (though the automatics are for the prevention of collisions where, in a sense, the company is forced to run trains at good speed, while at junctions speeds are in nearly all cases reduced); but the decision, whether the policy was or was not mistaken, is a matter of administrative discretion with which the state should be very slow to interfere. If a road lacks money, limitation of the speed of trains is one very rational means of avoiding large expenditures; but it is not a popular thing to approve slowness, and commissions are usually careful to avoid showing their hand in that direction. It is the duty of a state commission to call to account a railroad which does not give safe and adequate service; but to call for higher speeds at a score of junctions, at a time when the order necessitates the expenditure of large sums of money sorely needed for every-day necessaries of life, is a perversion of authority.

ANNOUNCEMENT is made in our news columns of the plan for the reorganization of the Western Classification Committee, which is to go into effect on January 1, providing for a permanent committee of three members, including R. C. Fyfe, the present chairman, to be in continuous session at Chicago to hear petitions for classification changes, instead of holding semi-annual meetings at various places. This is in accord with the suggestions made by Commissioner Meyer in his report last year following the Interstate Commerce Commission's investigation of Western Classification No. 51, in which he strongly urged the necessity of affording wider publicity and fuller public hearings in connection with the future development of classification. He also recommended that proposed changes be submitted in smaller instalments, giving ample public notice of hearings to interested parties, and that representatives of the state commissions and of the Interstate Commerce Commission be invited to participate in all such hearings. The holding of continuous sessions will make it possible to consider groups of related subjects at one time, thereby giving all who are interested a much greater opportunity to be heard than under the present system, as well as insuring full publicity. Not only will the state commissions be invited to the public hearings, but the Interstate Commerce Commission has been asked to have a representative present at all sessions of the committee, both public and private. In fact this practice was followed at the last meeting of the committee at St. Louis. As one result of the change, it is to be feared that a large number of carefully prepared winter vacations will be seriously interfered with, for the meeting that was to have been held at Monterey, Cal., in January will be abandoned. Without belittling the importance of classification matters to a great many shippers, it may be said that it is pretty well understood in traffic circles that a large number of the subjects that have gone to make up the bulky dockets to be handled at these meetings have been brought up by industrial traffic men chiefly to convince their employers of the necessity of trips to the meetings at pleasant summer or winter resorts. This being the case it is not strange that the popularity of classification committees with the aforesaid employers has not been increased when their traffic men have returned without having accomplished the ostensible purposes of their long and expensive journeys. However, to a large majority of shippers a classification meeting is a far more serious matter than a junket, and doubtless many who should have been present have been kept away by the time and expense involved. To these a permanent committee located at Chicago will afford a very real convenience. Moreover, the work of classification can be performed far better by a small number of men giving their entire attention to the work than under the present system under which a large number give only a small part of their attention to it; and it would seem that far better results from all standpoints could be obtained by holding hearings at different times on different groups of commodities than by trying to hear everybody at once. Again, a standing committee on classification is far less likely to be influenced by the power of tonnage than a committee composed of railway traffic officers in regular service, and will be able to work out the various problems presented to them in a more scientific and satisfactory manner than has been possible in the past.

TO MAKE DISCIPLINE JUST.

A RAILROAD superintendent, nowadays, with the up-to-date grievance committee constantly springing new arguments on him, is obliged to present every case of discipline to his superior so well fortified that it could run the gauntlet of the Supreme Court. That is to say, the general superintendent or general manager, when appealed to, will have presented to him by the committee such elaborate details and such forcible arguments against the superintendent's position, that only by equally elaborate details and still more forcible arguments can he prevent the committee from defeating him by mere weight. This looks like a very unfortunate situation for the superintendent. When the custom of appealing from dismissals and suspensions first began to be in vogue, many superintendents, accustomed to being final judges, sustained some very rude shocks. But there is another side to the case. Why should a superintendent ever impose discipline under any circumstances in which he cannot make out a strong case? Is it not a good restraint on him to be constantly reminded that he must dismiss or punish a man only for the soundest of reasons? Brotherhoods learn their methods from the lawyers and the courts; and in legal circles appeals, delays, re-arguments are the regular thing. No lawyer expects to win except after submitting to this test. The wisest judges, excepting the nine sitting in Washington, are constantly at the mercy of the litigant who has money enough to appeal. The railroad superintendent must in like manner submit to the appealer. Railroad men whom the superintendent disciplines cannot employ counsel and go to the courts—as does a disciplined policeman in New York City—nor do they over-awe the court with their money as do rich criminals in New York and elsewhere; but they have the aid of brotherhood leaders, who have nothing else to do but supervise and strengthen the grievance committees, and this resource takes the place both of lawyer and of money.

Realizing the difficulty of making out a case strong enough for the Supreme Court when, perhaps, the main issue depends on such subtle things as a trainmaster's judgment about what kind of error an engineman will commit *the next time*, some superintendents have adopted the simple expedient of discussing every decision in important matters of discipline with a half dozen division officers. This is not a cure-all, nor does it do away with all delays. But it is an excellent thing for clearing the atmosphere. On the Erie road all of the important cases of discipline are brought up before a staff meeting which is held in the superintendent's office regularly every week. The superintendent is, of course, the sole author of the decision that is finally rendered, but he has the satisfaction of knowing that if his opinion agrees with the verdict of his subordinate officers he has their backing, while if he decides contrary to the views of a majority of them he is put on his guard so that he will care to fortify the case in his own mind very carefully before putting his signature to the decision.

And such a course not only strengthens the superintendent's position, it also makes his work easier, for the trainmasters, master mechanics and others who make up his staff find themselves feeling a more serious responsibility, and they are less likely to make recommendations which have to be revised or overruled. They present their cases to their superintendent in such shape that he can decide them more readily, while at the same time they are making better progress than before in fitting themselves to become superintendents, when their turn comes.

Grievances of superintendents against grievance committees would be much less heard of if every superintendent were to do everything in his power to go into every discussion, not only well armed but well stripped; not only with his good arguments all at his tongue's end, but with all the poor ones buried out of sight.

GRADE SEPARATION LAWS.

THE abolition of grade crossings of railways and highways wherever possible is so important for the public safety and convenience that the legal provision for such work is a proper subject for legislative action. Nearly half of the states now have laws touching on the separation of grades, and the fact that 43 bills were introduced in 19 state legislatures and 13 laws were enacted in 12 of those bodies during the last legislative year shows that this matter is receiving plenty of attention from the law makers.

Some of the laws passed have been equitable and properly drawn to safeguard the interests of all concerned. Others indicate a desire on the part of their framers to force unwarranted expenditures on the railways. The two most important provisions of such laws are those fixing the manner of determining the necessity for proposed work and the apportionment of the cost. While in most cases either the Public Utilities Commissions or the courts are empowered to hear petitions from local authorities or citizens and to decide on the necessity of work involved, in some states the elimination of a fixed number of crossings each year is made mandatory regardless of the necessity for the work. Such a requirement tends rather to deter than encourage the rapid removal of grade crossings. Very few railways operate in only one state, and although the necessity for grade separation may be much more urgent at other points on the line, this work must be concentrated in states having mandatory provisions in their laws, for no railway company has unlimited amounts to spend for improvements which produce no revenue and in most cases have little effect on operating costs. A provision for a fair hearing as to the necessity for each piece of proposed work serves the interests of the public in general much better than a mandatory law, as it tends to concentrate expenditures at crossings where the need of grade separation is the greatest.

In fixing the proportions of the cost of grade separation work to be paid by the railway, city, town, county, state, street railway, public utility company, or other interested party, many of the laws indicate the prevailing tendency to burden the railways with all they can or will bear. Public opinion usually favors the assessing of all or practically all of the cost on the railway company. Even in Chicago, where the city's share—only the damages to abutting property—has been less than one per cent. of the cost of the work, which was paid entirely by the roads, there has been considerable agitation against the railways on this ground and one citizen's organization protested strongly against the payment by the city of a damage claim awarded in court to the owner of property affected by track elevation. While it is very difficult to determine exactly what division of cost is equitable, it is hard to see the equity of compelling the railway under all conditions to pay the entire cost of elevating or depressing its tracks, building new street approaches and subways or viaducts, as well as to pay all damages to abutting property, as is required by the state laws of New Hampshire and New Jersey. In fact, the commission in New Hampshire has in one case, on appeal of the railway, disregarded this law, and arranged an agreement by which the expense was divided 65 per cent. to the railway and 35 per cent. to the city.

In a decision on a petition for the separation of grades in Milwaukee the Wisconsin Railroad Commission concluded that "as both the railways and the city enjoy benefit from the existence of the tracks and will enjoy benefit from the separation of the grades as proposed, both should share in the expense." The division in this case assigned to the railways all work within their right of way lines except the grading and track work within the outside rails of electric lines and the changes to public utility mains. While this division forces the railways to bear a very large share of the total expense, which may or may not be equitable, it is rather

more fair to them than the divisions made in other cities where the most work has been done.

Although the actual benefits to be derived by the railways from the separation of grades, which are principally the saving in running time through cities and the decrease in personal injury claims, are not large, these items usually increase directly with the size of the city in which the work is done, and, on this basis, if the Milwaukee decision is equitable, the railways should not be apportioned as large a part of the cost in smaller cities. If a certain division of cost is found equitable for the separation of grades at a crossing where the highway was well established and carrying a heavy traffic before the railway was built, certainly the same apportionment would not be equitable at a crossing with a street which was opened over an existing railway line and the opening of which was due, perhaps, to a growth in the city which was a result of the transportation facilities afforded by the railway. The assessment to the railways of all or practically all of the cost of grade separation work can also be attacked on the basis of equity as between the communities served by a road. Since the cost of the work must be taken from earnings, all of the communities served by the road bear their share of the expense of an improvement which is of benefit only to the one community in which the work is done.

THE DISCUSSION OF GOVERNMENT OWNERSHIP.

THERE recently has been a notable revival of the discussion of government ownership of railways in this country. Two magazines appealing to classes that can hardly be called the most intelligent have been running series of articles advocating that policy. The chairman of one of the state railroad commissions recently has made an address and written letters trying to show that private ownership is costing the American government $400,000,000 a year; and his utterances have called forth vigorous replies from President Ripley, of the Santa Fe. In Iowa, steps have been taken to start an organized movement for public ownership, and it is reported that one of the United States senators from that state will introduce a bill providing for it.

It may seem unfortunate for the railways that just when they are making the hardest fight in their history for fair regulation the question of the desirability of government ownership should be raised. The *Railway Age Gazette* believes that this is not unfortunate but fortunate for both them and the public, and that the railways should meet the issue squarely, and aggressively.

It has been inevitable, ever since the present policy of regulation was entered on, that in time, and in a relatively short time, it, and the controversies to which it was bound to give rise, would force the question of government ownership to the front. Every time, since the present policy of public control was entered on, that the railways have opposed any form of regulation, they have been warned by its advocates that unless they submitted the worse fate of government ownership would befall them. They probably will continue to be thus warned and threatened until the question of public ownership itself has been threshed out; and until then this form of threatening probably will tend to secure the adoption of forms of regulation which the roads oppose. For there are now many people who really believe that the public has much to gain, and the railway managers and owners everything to lose, by the adoption of public ownership; and who, therefore, will be prone, until the subject of public ownership has been more thoroughly discussed, to feel that so long as the public refrains from taking over the roads it will be justified in imposing on them almost any burdens or restrictions that it may please. Public ownership is, of course, the alternative to private ownership, subject to public regulation; and therefore discussion of public ownership and crystallization of public sentiment regarding it may be prerequisite to a fair and beneficial solution of the problem of public regulation. It is because we believe this to be the case that we regard it as fortunate rather than unfortunate that there is occurring a marked revival of interest in the question of government ownership.

Assuming that the creation of an enduring public opinion in favor of the continuance of private ownership is prerequisite to the fair solution of the problem of public regulation, what may we think as to the practicability of creating such a public opinion? There are numerous serious difficulties in the way. First, the trend in our own country, and throughout the civilized world, is toward state socialism. The widespread mistrust of state action which was characteristic of the public opinion of the early part of the last century has given way to an equally widespread and unreasonable belief in the omniscience and omnipotence of the state. Secondly, many leading countries have adopted government ownership of railways; and it is often easier to persuade people to do what others have done than to persuade them to investigate the results of what others have done. Thirdly, there have been, and continue to be, many real, and still more seeming, abuses in the management of American railways. These things always promptly arise to confront anybody who undertakes to argue against public ownership; and, of course, the American public knows a great deal more about them, and feels much more keenly about them, than it does about the abuses and shortcomings in the management and operation of the state railways of other countries.

On the other hand, there are many conditions which strongly favor those who oppose government ownership.

First, while there has been in recent years a marked growth of socialistic sentiment in this country, the American people probably still believe more strongly in the benefits of private enterprise, and have less confidence in governmental paternalism, than the people of any other leading country. This is largely because of their own experience with governmental handling of business matters. They have seen their post office offices filled with political appointees and their post office department so managed that nobody can tell what the financial results of its operations are except that its receipts seldom equal its bare operating expenses. They have seen $600,000,000 spent on improvements in inland waterways, in spite of which, because the money has been laid out "pork barrel" fashion, there are as yet no waterways in the country that carry a considerable traffic except the Great Lakes, which were provided by nature. They have seen public buildings, and even army and naval posts, located where they would best promote the interests of politicians, and almost regardless of where they would best promote the interests of the public. They have recently seen a Panama canal toll law passed which violates a national treaty in order to give a subsidy to a few ship owners, and for political reasons works an unfair discrimination against the people of the Middle West and in favor of those on the coasts. They have seen every imaginable form of extravagance, waste and even dishonesty in their city governments and in the management and operation of municipally-owned public utilities. These things, and many more like them, have made an impression on the minds of the American people which will not be readily effaced; and until it is effaced the argument that the government could and would manage the railways satisfactorily will have difficulty sinking in.

Second, with all their faults, the management and operation of the railways of the United States have been and are such, as compared with the way other public and private affairs have been handled in this country, and as compared with the way the railways of other countries have been managed, as to render it practicable to make an extremely strong case for private ownership and management. To the counts that there has been much unfair discrimination and that their accident record is bad our railways must plead guilty. But regulation has greatly reduced the discrimination; and the statistics of the railways of our own and other countries demonstrate that there is no connection between the form of ownership of railways and their safety. On all other counts in the indictment that their critics draw against them our railways probably can make a better defense than could any other railways in the world. Their capitalization per

mile can be shown to be much less than that of any other railways that can fairly be compared with them. They can be shown to pay the highest wages of any railways in the world, not only absolutely, but also in proportion to the cost of living in this country. It can be shown that, in spite of this, they make as low passenger rates as any other railways having a corresponding density of traffic, and the lowest freight rates in the world, except, perhaps, in Japan, where, of course, wages are extremely low; and that in proportion to wages and prices in the country where they are charged, their passenger rates are among the lowest, and their freight rates much the lowest, in the world. That they are able to do these things can be shown to be due to the fact that they have been developed and are operated with a skill and an economy that are the wonder, the admiration and the envy of railway managers throughout the world. The only country where the efficiency and economy with which American railways are operated is not conceded and appreciated is the United States! It can be shown that in no other country is the service rendered by the railways any better, or perhaps so good, considering the conditions under which it is rendered. It can be shown that while most state railways fail to earn the interest on the investment in them, leaving a deficit to be raised by taxation of the public, the railways of the United States return to the public in taxes almost 4 per cent. of their gross earnings, or about $110,000,000 annually. Finally, and most important of all, it can be shown that in every democratic country where the public owns the railways the employees constantly use their political influence as voters to get concessions from the managements, and that the transfer to the government service of the 1,700,000 employees of the railways of this country, most of them organized into strong unions, probably would have the most baneful effects on politics, if, indeed, it would not work the overthrow of democratic government.

The case which can be made out in the court of reason for private ownership and management in this country is, on the whole, very much stronger than that which can be made out against it. The real danger is that the matter may not be settled in the court of reason, but in that of ignorance, sophistry and demagoguery, where so many questions of regulation are being settled. But the question of public ownership of railways is so extremely interesting and of such stupendous importance that it is probable that before it is finally acted on it will be given the most animated and thorough discussion and consideration; and the American public usually decides right on questions that have received such discussion and consideration.

"SAFETY FIRST" DEMANDS MORE THAN WORDS.

"SAFETY FIRST," as a watchword, if of any value, must be followed through thick and thin; success is not the only desideratum. If success eludes pursuit, all proper effort must nevertheless be continued. A reduction in the number of fatal or non-fatal accidents in a month or a year is an encouragement; but the duty of conserving lives and limbs remains, even if evidences of success are deferred. J. B. Fisher, superintendent of the New York division of the Pennsylvania, speaking to a recent meeting of a thousand of his employees in Jersey City (reported December 5, page 1086) said that in the past year the number of employees killed on that division had been larger than in the preceding year. Possibly an increase of business or in the number of men in service might afford some slight basis for an explanation of this increase; but Mr. Fisher rightly emphasized the point that percentages are not necessarily instructive; that actual causes are the thing to be studied. The aim of all should be to reduce the fatalities to zero. And he called the attention of trainmen to the fact that the increase was mostly in their class. Among the track repairmen—many of whom are ignorant, and often are classed as dull—the fatal accidents were fewer; but the records of trainmen and other classes more than balanced this decrease. And Mr. Fisher told the trainmen plainly that many of these cases of fatal carelessness ought to be classed as recklessness. The trainman feels too "smart." In other words, the spirit which in the old days of the link-and-pin car coupler impelled men to risk their limbs, and often their lives, because they were too proud to couple with a stick instead of using their fingers, still prevails. There is, no doubt, a basis of truth for this view. Risky things can be done hundreds of times and be followed by no bad results; and to see the need of being constantly cautious so as not to be caught unawares the ten-hundredth time one must exercise his reasoning faculties. The safety-first movement must be availed of by everybody as a lesson in reasoning, if the expected good results are to be accomplished.

The Delaware, Lackawanna & Western also has published some figures which show that improvement in safety is not an easy thing to be produced by talking. The Lackawanna has accomplished encouraging results by its safety-first measures, as have other roads; but in August and September the number of employees killed was not smaller, but larger, than in the same two months of the preceding year.* Commenting on this record, and to show how great a responsibility rests on the individual, howsoever much the company may try to do by means of precept or admonition, the claim department prints a statement of the causes of the 12 fatalities, which statement is copied below. This is a sobering record. Its 12 items illustrate 12 of the innumerable ways in which a small error can be the cause of a great horror.

1. Trainman went from his engine, which was on a siding, to the switch leading to the main track in order to let his train out after a through passenger train had passed. He fell asleep in such a position that his head was struck by the engine of the passenger train and he was killed. At time of his death this man had been on duty only 9 hours and 50 minutes and had been off duty over 13 hours before commencing the fatal trip.
2. Laborer had repaired door of a bad order car and started to walk around the east end of this car and through a space of only three feet between this car and the next. Some other cars were kicked down this track and he was squeezed so badly that he died. He had neglected to display a blue flag. There were no cars west of the bad order car where he could have safely crossed.
3. Trainman was hanging on side of coal car in a moving train cooling a hot box and was struck by a bridge which had proper clearance. He was killed.
4. Plumber stood upon a hot water pipe in a power house pit in order to be able to reach the floor. His weight broke the pipe and he was scalded to death.
5. Trackman was pulling weeds and did not notice an approaching train. He was struck and killed. Proper signals were given.
6. Employee in train service was dead-heading home and found that he had boarded the wrong train. In jumping off he fell and was killed.
7. Flagman dropped off eastbound train to go back with the flag. He stepped over on adjoining track and was struck and killed by a westbound train.
8. Flagman riding on front end of passenger train on which he was working, jumped off forward portion of the train as it was approaching terminal station, slipped on station platform, fell under train and was killed.
9. Section gang was filling in track and was warned about an approaching train. One member of the gang saw the train coming and yet stood so close to the track that he was struck and killed.
10. Bridge inspector was riding a speeder against the wind with his head down. He ran into a train and was killed. All warnings possible were given.
11. Trainman while turning up retainers on a moving train fell from it and was killed. No defects in equipment nor unusual speed of the train.
12. Track laborer tried to board a moving drill engine to get a ride to his work which was only 500 feet away. He slipped, was run over and killed.

To the thoughtful trainman, and indeed to any person employed around trains, each of these 12 lessons contains the material for a short chapter in itself. The list does not tell everything; it does not show how many of these men were young or inexperienced or insufficiently trained; or whether they were liquor drinkers or had habitually misused their rest hours. The question of possible contributory blame on the part of other employees is one which also is of interest in cases of fatal accidents. To know whether the accident occurred by day or night is instructive sometimes. Often it is claimed that a man has been overworked; in issuing a statement in print this point

*Twelve in 1913 and five in 1912. For nine months to October 1 the number of employees killed was 32; in 1912 it was 31.

should be dealt with. Such claims, when unfounded should be exposed. Many employees who have been killed are known to have manifested reckless habits on previous occasions. One of the lessons of such a death may be that some one has neglected a plain duty in not removing the careless man from a position where life depended on habits of carefulness.

These obvious comments are mentioned here, not by way of criticism of the Lackawanna's list—the list may tell all that it would be useful to know concerning these causes—but as a reminder that to conduct train work, yard work or track-repair work with the highest attainable percentage of safety is a problem which includes many far-reaching problems.

NEW BOOKS.

The Truth About the Railroads. By Howard Elliott, chief executive officer of the New York, New Haven & Hartford, and of the New England Transportation Lines. Bound in boards, 260 pages. Price, $1.25. Houghton Mifflin Company, Boston and New York.

This book is chiefly a collection of addresses which Mr. Elliott has made on various occasions within recent years. They deal with different phases of the railroad problem in the United States; and when brought together, as they are here, with the references to particular times and places eliminated, they constitute an interesting and pretty comprehensive discussion of the present situation and prospects of the railways, of their relations with their employees and the public, and of railway regulation.

One of the most marked characteristics of the book is the broad spirit of co-operation which it manifests; and another is its insistence on the rendering of justice on the sides both of the railways and the public as a prerequisite to true co-operation.

The chapter headings give a good idea of the work's contents. They are as follows: "Co-operation Between the Railway Owner, Employee and User"; "The Individual, the Corporation and the Government"; "The Conservation of Railway Service"; "Rate-Making and the Government"; "The Relation Between the Farmer and the Railroad"; "Agriculture, Banking and the Railroad"; "Transportation in New England"; "Public Opinion: Its Effect on Business."

Abstracts of most of these addresses have been published from time to time in the *Railway Age Gazette* and many other publications; in fact, few railway men's utterances have attracted so much attention within years as Mr. Elliott's; but to be fully appreciated the addresses should be read together and as a whole. They are bound to do the railways good wherever they are read; for Mr. Elliott has a gift for stating the railway case strongly and even aggressively, and at the same time so tactfully that he could hardly give offense even to those most hostile in their attitude toward the roads and their managements.

Government Ownership of Railways. By Samuel O. Dunn, Editor of the *Railway Age Gazette;* author of the "American Transportation Question." Bound in cloth, 400 pages. Price, $1.50 net; by mail, $1.62. D. Appleton & Co., New York and London.

The principal purposes of this book are stated by the author in the preface. "One is to give information as to the comparative results of private and public ownership and management of railways in various leading and typical countries. Its other, and main purpose is to direct serious consideration to the question of what would probably be the results of government ownership and management of railways in this country." The author long has believed that the policy of public regulation, and other conditions and developments would rapidly raise the question of the desirability of government ownership; and he has sought in this work to supply information that would throw light on that question.

In the first chapter he sets forth the reasons why the question is bound in course of time to come up for very serious consideration, and why it must be of peculiarly great importance in the United States. Two chapters on "Relations of Railways to the State," and one on "The Causes of Government Ownership," give the present situation in respect to the ownership of railways throughout the world; the history, briefly, of the relations between the railways and the state in the important countries; and the reasons why government ownership has been adopted where it prevails.

The economic phases of the subject are then taken up. The conclusion reached in the chapter on "Cost of Capital" is that the government probably would not have, at least for some years to come, to pay, in the aggregate, as large a return to capital as do private corporations, but that this would be because, while private capitalists now assume all the risks of ownership and management, under public ownership the taxpaying public would assume them. This naturally raises the question as to whether, on the whole, government management would be more or less economical than private management—a question that is discussed at length in chapters on "Organization and Official Personnel," "Effects of Consolidation Under Government Ownership on Economy of Management," "Influence of Political and Labor Conditions on Economy of Management," and "Economy of Management of State and Private Railways." The conclusions reached, from a review of the evidence, statistical and otherwise, are, first, that private railways usually are operated more economically than state railways with which they may be fairly compared; second; that the state railways of undemocratic countries, of which Prussia is the best example, are operated more economically than those of more democratic countries, where political influences affect them more; and, third, that, under the political conditions existing in the United States, the railways of this country probably would be operated very much less economically under public than they are under private management.

Chapters dealing with the adequacy, the quality and the safety of service follow. The evidence is found not to support the view often urged by advocates of state ownership that in these respects state railways are superior to private. For example, it is shown that car shortages are quite as well known on the state railways of Prussia as on those of the United States, while they are practically unknown on the private railways of England; and that while the accident record of the private railways of the United States and Canada is bad, there are private railways, such as those of England and France, whose records for accidents are fully as good as that of the state railways of Prussia, and state railways, such as those of France, with accident records fully as bad as the worst records made by private railways.

Three chapters discuss rate making on state and private railways. The author concludes that state railways tend to make their passenger rates lower than private railways, while private railways tend to make their freight rates lower than state railways. He believes that unfair discrimination is more apt to be practiced by private railways, but that their managers show more enterprise and skill in so adjusting freight rates as to promote the development of industry and commerce.

The chapter on "Financial Results" shows that practically all state railways, except those of Prussia and Japan, fail to earn the interest on the investment in them, leaving a deficit to be paid by the taxpayers. That on "Condition of Labor" discusses the advantages and disadvantages of public ownership to the working class; but that on "Political Effects" deals especially with the probable political consequences of adoption of government ownership in the United States.

The last chapter sums up the various conclusions. The general conclusion arrived at is that while government ownership has worked well in some countries its adoption in the United States under existing conditions would be a step fraught with the gravest danger to both the economic and political well-being of the country.

The book contains a large amount of specific information regarding the history, organization, service, rates, earnings, expenses, financial results, condition of labor and so on on railways of numerous countries, and especially on those of Germany, the United Kingdom, Belgium, France, Italy, Austria-Hungary, Australasia, Canada and the United States.

Letters to the Editor.

SWITCH INDICATORS.

HARRISBURG, Pa., October 28, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I was very much interested in the article in your issue of October 24, referring to switch indicators. The Philadelphia & Reading has a fixed rule requiring the use of indicators at all switches in automatic signal territory, and while it is true that short-flagging, and at times the absence of flagging, may result from irregularities on the part of trainmen, it would seem that the net results show a credit due to the use of the indicators. Whether or not flagging rules are obeyed depends on the amount of inspection employed and the severity of the discipline imposed.

When indicators are not provided the way is opened for a very serious complication in the operation of a busy road. For instance, a train might receive a clear signal at the entrance of the first block in the rear of that in which there is another train standing on a siding and waiting to come out on the main track. The former train may run through that block at speed and approach the signal at the entrance to the block containing the siding on which the second train is standing and find that signal at clear. The second train, having no indication or warning of the approach of another train, is at liberty to go out on the main track under flag protection if it is not on the time of a superior train, and it might often happen that the switch would be thrown just before the following train reached the signal at the entrance of the block, throwing that signal to stop immediately in front of the train. Serious damage might result from the sudden application of air brakes to a heavy train moving perhaps 30 or 40 miles an hour, under these conditions.

For this reason the writer greatly prefers the use of indicators. They give due notice to the men in the siding and their efficiency in preventing wrecks and damage to equipment from the sudden application of brakes will be kept at a very high level by a proper inspection of the performance of trainmen and the employment of strict discipline for infractions.

R. B. ABBOTT,
Division Engineer, Philadelphia & Reading.

EFFICIENCY IN LARGE YARDS.

HARTFORD, Conn., November 7, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Mr. Hale has asked for letters from men who actually handle the cars, as to just what they are doing to expedite movements. This would savor of blowing our own horn and looking for praise for doing our simple duty. So many factors enter into it that one knows hardly where to begin. The first principle to get fixed in one's mind is that a yard is not primarily intended to hold cars but is a place from which they are to be despatched. Usually the yardmaster is hampered by more work than he has facilities and force to handle expeditiously. This, of course, is no new truth. The superintendent, working on the basis of "cost per car handled" compares cost of one period with another and is anxious to see the figures decrease, believing that to be a test of the yard's efficiency.

The cost of per diem charges should be charged against a station, yard or division. This would tend to center attention on the release and forwarding of empty cars. We are systematically at certain dates given the "car situation" and urged to do everything possible to release and hurry home all foreign cars. I have often asked myself how many agents and yardmasters—and, indeed, I may say how many officers—have made a thorough effort to comply with this order. Is not the method wrong to a certain extent? Is not the personal, heart to heart talk by the trainmaster or superintendent more effective?

A thorough knowledge of the character and source of the freight received in foreign cars, together with the same knowledge of shipments from each station on your own division should make possible a better use of foreign cars for homeward loads.

The average car distributor does not get out of his office, and he is liable to get into a rut. The old Cape Cod signs along the sandy roads, "Do not rut the road," would be a good thing in our business. Many trainmasters and superintendents are overburdened with other work of equally great importance and for that reason do not give much personal attention to the car question; but this explanation does not help us any. Some roads do have regular "car chasers" who even go away from home, to locate their own cars. Others have district inspectors (not division) reporting on demurrage matters to the car service department and co-operating with division officers. These men might to very great advantage go farther and report on cases of improper use of foreign cars—allowing cars to remain on hand after released; failure to report empty cars and also cases where local freight conductors are standing off the agent and not moving his empty cars.

I have been able to correct lax methods by taking a list of all cars at a station and checking it against the agent's car service book. This will disclose cases of empty cars not moved promptly, foreign cars loaded when home cars were available if properly placed, and loaded cars not promptly placed for unloading.

Another method used was to require agents to send me a carbon copy of their car service report. This showed up various things that would escape clerks in the office of the car service department, such as cars allowed to remain on hand after empty, and cases of company freight delayed, which would be released when a personal request was made on the proper department head. I have referred to way freight crews standing off the agent. This can be, and is almost, entirely overcome in territory where local runs are arranged so that the crews doing the local switching are returned to home terminal every day and thus do the work both ways. They then realize that the fewer cars at a station the easier their work will be, and are likely to prod the agent instead of waiting for him to prod them.

A short time ago, when in charge of a division terminal yard, I was making up solid trains for three Western terminals, when the division west of me suddenly shut down on taking empty cars. These trains contained a fair proportion of system cars, the balance being foreign meat, stock, box and coal cars. The situation did not clear up and I was soon obliged to re-switch to get out meat and stock cars.

We were then bordering on a blockade and obliged to work out of a bad situation as best we could. But we got a lesson, and after cleaning up, we set in force a new plan. At the first indication of a hold up on westbound cars I began to hold out all system cars and store them on outside tracks. This resulted in all foreign cars moving as fast as engines were available. There was no re-switching, and all system cars were ready in solid trains for local orders on divisions east of Buffalo. We were handling around 2,000 cars a day, probably half foreign. The saving may be imagined. So far as I know my superintendent never knew of it.

At another time, while the 20-day penalty agreement was in effect, an embargo was placed on hay destined to New York City. Almost before we knew it 800 cars had been backed up in our yard. The blockade was gradually worked down, a train or two a day, until only 135 cars remained. I then made a list of all foreign cars, together with the penalty date of each, and found 16 cars on that date already past the limit; four or five more would become penalty dates the next day and a week would see them all alike.

Without asking for instructions an extra shifter was put on and all the foreign cars made up into a train. When the situation was explained to the superintendent of freight transportation, room was made in New York City yards and the train of foreign cars was placed for delivery before daylight the next

morning. It should be noted that it was necessary to call on the chief despatcher and insist that he call the attention of the superintendent and get him to see that the train went forward without hindrance.

Somehow a foreign car has come to have on me somewhat the effect that a red flag does on a certain domestic animal. This has resulted in many a car seeing home earlier than otherwise it would.

There are a few things in the nature of an experiment that I have long wished to see tried, to show the actual history of a car from the time it comes on the line until it leaves. Let some one take a list of a train just as it is to be delivered to a connecting road at any western terminal. Now go back to the record office and get the date and hour of receipt from connecting line, destination, when made up in train and hour and date of forwarding. Let the yardmaster explain delays, if any. Next have delays in transit explained by the chief despatcher; date and hour of arrival at destination with exact placing time. Get records of when released and when placed for loading; and in the reverse manner the same information back to the delivery of the car whence it came. A home route card giving train and station records from receipt of car to return would be valuable in any case.

The superintendent figures the efficiency of his division from moving a certain number of cars a day with a certain number of engines and with an eye on overtime and yard expense. Does he know that a drag received from the Union Pacific at 11 p. m. was switched before one received at 11 a. m. from the Rock Island; or that by paying an hour's overtime 50 or 75 cars would have been released to the Missouri Pacific?

He has nothing to show that the local freight conductor stood off the agent at Jonesville and left a bunch for "the other side of the run." He does not have any check on yard or station operation except the "average detention." It is impossible to devise any method that will do this automatically. However, if we charge the actual per diem charges to a terminal's expense as we do the cost of engines and men we shall then have an incentive to force delays to a minimum.

The yardmaster should be given a free hand to work out such plans as will bring this about. The yard as a machine or plant may show a larger cost per car, *but a decreased cost of per diem.* In this connection frequent visits of the superintendent and a frank spirit of co-operation have been known to work wonders in increasing the interest and initiative of men actually assigned to the task. E. T. HOPKINS.

IS STANDARD CODE RULE 20 SAFE?

KANSAS CITY, November 13, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

An extra west at Pekin, a blind siding, held an order that 2d No. 14 eastbound would run two hours late, A to Z.

No. 14 was due to leave A at 4:00 p. m.; No. 18 was due to leave A at 4:10 p. m. A train displaying green signals passed Pekin about 15 minutes late on No. 14's schedule, which the extra west mistook for 1st No. 14, but which in reality was 1st No. 18.

Following this train was 2d No. 18, which the men on the extra figured was regular No. 18. They concluded that 1st No. 14 and No. 18 had passed, and as they held two hours on 2d No. 14, they proceeded accordingly, but before going very far met another train on the main line, which proved to be 1st No. 14. First No. 14 was delayed at A and 1st and 2d No. 18 passed it at that point.

Who was to blame for the hazard?

This and a number of similar cases were related at Chicago during the superintendents' convention in August and the joint train rules committee of the American Association of Railroad Superintendents and the Train Dispatchers' Association of America took up the question with a view to making such recommendations as should seem adequate to overcome the possibility of a hazard on account of the defect in the rule.

It was agreed that a distinction ought to be made between the last section of a convoy of sections and a single train fulfilling a schedule.

It was practically agreed at the joint committee meeting held in Chicago, August 20, 21 and 22, that first and intermediate sections ought to display yellow signals to denote a section following and that the last section should display green signals to denote schedule fulfilled. A single train fulfilling a schedule to display no signals.

But that is not the best plan. The committee was short of time and did not have an opportunity to give this important subject the consideration it deserves, and since that meeting it has been proposed, and will likely be recommended by the joint committee, that Rule 20 be modified to the extent that first and intermediate sections of trains display no signals and that green signals be displayed on the last section to denote schedule fulfilled, and that a single train fulfilling a schedule display yellow signals to denote schedule fulfilled.

Under this arrangement it will not be necessary to give the whistle blasts to call attention to flags or lights, as the inferior train will be obliged to be on the lookout for a signal which will permit it to proceed instead of looking for a signal which restricts its rights.

If we were to display yellow signals on first and intermediate sections, to denote a section following, and green on the last section, to denote schedule closed, and if we had three sections of No. 1 running late and on the time of No. 3, and the signals on 2d No. 1 became accidentally extinguished or carelessly forgotten, an inferior train might mistake that particular section of No. 1 for No. 3 and after 3rd No. 1 had passed, displaying green signals, proceed against No. 3.

Under the later proposal, where first and intermediate sections display no signals, and the last section displays green to indicate schedule fulfilled, and a single train fulfilling a schedule displays yellow, to denote schedule fulfilled by a single train, we are adhering to a principle that is absolutely safe, as well as sound and logical.

Would this arrangement have prevented the hazard referred to above? Let us see.

First No. 18 comes along displaying no signals. The absence of a signal is adverse to the waiting train. The extra might call it 1st No. 14; but next comes a train displaying green signals to denote a schedule fulfilled by the last section of a convoy of sections. The extra held an order that 2d No. 14 would run two hours late. The conclusion would then be forced that the first train was 1st No. 18. And the extra would not have pulled out in face of 1st No. 14.

If we were just forming a set of rules for the government of train movements, would not the logic of the recommendation tend to compel its adoption?

The suggested change will seem radical and, judging by past experience, will meet with opposition because of fear of danger in the change. But is there not more danger in retaining the present method?

This proposal is strictly in line with the slogan, "SAFETY FIRST." A signal accidentally extinguished or carelessly forgotten can result in no hazard; it merely ties the train up. It is a progressive step. Enginemen will no longer have to "whistle signals," and this will tend to abate the noise nuisance and give our "pernickity neighbors" less cause for complaint. It will lessen the occasions of disturbing the slumbers of passengers in sleeping cars. P. T. D.

WOMEN RAILWAY WORKERS IN RUSSIA.—The Ministry of Roads and Communications has given permission for women who have obtained the certificate of railway runners at the Women's Polytechnic in St. Petersburg, to be employed in responsible posts on the state railways, with all the right of other state employees.

RAILWAY BUSINESS ASSOCIATION.

Howard Elliott Frankly Goes to the Heart of the Railway Problem—Governor Cox Outlines Sane Governmental Attitude.

The Railway Business Association held its fifth annual meeting at the Waldorf-Astoria hotel, New York, on December 11, 1913. The business session was held in the morning and the annual dinner in the evening; George A. Post, president of the association, acting as toastmaster. Two addresses were made at the dinner, one by Howard Elliott, chairman of the board of directors of the New York, New Haven & Hartford, and the other by Governor James Cox, of Ohio. There were over 1,000 present.

REPORT OF EXECUTIVE COMMITTEE.

The annual report of the general executive committee of the association is more or less optimistic, especially as regards the outcome of the rate hearings. Some of the more important parts of the report are as follows:

"Current experience," says the annual report of the general executive committee, just mailed to members, "tends to dispel the most serious ground for doubt of success for public regulation of privately owned railways. The fear has been that no tribunal of political origin would survive if it permitted an important general increase in transportation charges, because, it was predicted, the shipping public would always resist and when defeated would retaliate by attacks upon the commission. Instead of this we actually see organized shippers sending resolutions to the commission declaring not only that they will cheerfully accept an advance if found necessary, but that they will not be represented in opposition at the hearings.

"The public does not and should not relinquish its purpose of scrutinizing the practices of railway corporations and dealing with these where necessary. But it has been made manifest that when national prosperity requires a strengthening of railway revenue, public opinion will discountenance attempts to postpone action on the pretext that one or another specific theory of conduct must first be established and enforced. Railway managers are endeavoring as energetically as business men or men in public life to improve standards both of efficiency and of propriety.

"A number of members of the Interstate Commerce Commission and of state commissions after long service but still in vigorous health have recently retired. Not even an enlightened public opinion will insure the success of regulation unless men who have acquired experience and knowledge are retained. Security of tenure minimizes the waste of time and danger of mistakes involved in breaking in new commissioners, it gives the older commissioners an independence and serenity which promote efficiency and quality of work and it enables the appointing power to command the services of men who would not accept if they believed the position would be used as a political reward.

"Increased expenditures were compelled in 1913 by full crew laws passed in Arkansas, California, Missouri, Nevada, New Jersey, New York and Ohio; by safety appliance laws passed in California, Colorado, Florida, Kansas, Michigan, Missouri, Nevada, Ohio and Texas; by hours of labor laws passed in California, Missouri, Nevada, New York and Ohio, and by grade crossing laws passed in Arkansas, Minnesota, Missouri and New Jersey. The 40 state legislatures in session in 1913 enacted 343 laws specifically affecting steam railways as against 276 passed by 40 legislatures in 1911. The addition to operating expenses will aggregate very large sums. Only one state, New Hampshire, adopted a law permitting the railways an advance in freight rates prohibited under the previous statute.

"No systematic method has yet been put in effect for coordinating Congress, the legislature or the wage arbitration board which compels expenditures with the commission which regulates rates. We urge the need of mechanism for holding down the obligatory outlays to fit the railway pocketbook.

"Our association participated in the successful effort to have Congress amend in 1913 the federal railway labor arbitration law. The changes made tend to assure the acceptance of arbitration by both sides and are fairer to both sides in that two neutral arbitrators instead of one must be convinced. Many believe that the danger of strikes should be guarded against by the further step of prohibiting, as in Canada, a strike pending an official investigation and publication of findings. The policy of urging this provision upon Congress and the state legislatures should be carefully considered."

HOWARD ELLIOTT'S ADDRESS.

Mr. Elliott discussed the railway problem frankly and in a most searching manner. His address may be roughly summed up as follows:

National need of terminal and other railway facilities having been thoroughly impressed upon the public mind, shippers and editors generally convinced that larger net railway returns should be permitted, what are the reasons and perplexities which prevent the people from giving effect to a policy that will cure the trouble, making it unanimous? Even if there is only a vigorous minority opposed to such policy candid consideration of their objections is due them.

Root Out Dishonesty.—It is claimed that the management of some roads has not been honest—that insiders have profited when they should not. The morals of all kinds of business have improved year by year and things have been done in railroad and other business in the development of the country that were probably not right then—and that certainly are frowned upon now by law and public opinion. Such things ought never to have been done. Owners of railways should root out dishonesty if it exists, and if they will not, public authority will do it. But is there anything in the situation that warrants calling a halt on the development of a continent? Every time a clergyman, a doctor, a senator, or a cashier is punished, are we forthwith to abolish all clergymen, all doctors, all senators, and all cashiers, while we unfrock that particular clergyman, convict that particular doctor of malpractice, expel that particular senator, or jail that particular cashier?

Prevent Over-Capitalization.—It is said that some railways are over-capitalized. Whether they are or not, and certainly American roads have led the world in refraining from it, no more capitalization ought to be created than is necessary in order to serve the public. If too much was issued by some roads in the past, this is to be regretted, but no workable method has been suggested by which securities issued legally and bought in good faith can be taken from their owners without failures and receiverships that harm many more people than the owners of the securities. As for the future, every railway of importance runs through one or more states which regulate security issues. And apart from that, those responsible for railway management realize, as they never did before, the absolute necessity of sound business principles in issuing securities, law or no law. The present problem is not to restrict the issues of securities but to find people willing to buy them.

Banking Experts Necessary.—One hears that if securities were sold over the counter the bankers' commission would be saved. Perhaps some day, if confidence can be restored, part of such commissions might be saved, but a railroad must have financial experts, as well as engineering experts, and pay a fair price for services rendered. If the commissions can be saved they ought to be. But not even city, state and federal governments, whose credit is based on the taxing power, have been able at all times to float even moderately large popular loans without the aid of bankers; so it would seem to be to the interest of the people to be patient with a railway which has practically no control over the price of what it has to sell—transportation—and very little

control over the price of labor needed to produce that transportation.

Dividends Sustain Credit.—Others object because they say the new revenue would go to increase dividends. So some of it would and must. The dividend which a stockholder receives is not all that he would like or that his managers want to pay, but is an amount needed to induce him and others to buy more stock or bonds when an enlarged plant is necessary in order to meet the desires and absolute necessities of the public.

Income from Economies.—It is said that the increased income needed could be had by economies. It is true that economies have been introduced, and there is room for more of them. Railroad managers as a whole are pushing hard every day to improve men, methods and facilities. Many economies, however, can only be adopted by throwing away old appliances and buying new ones, which is the case in mills and factories as well as in railroads. And if the railroads have no money with which to get the new tools they must do the best they can with the old ones. No effort in this direction should be neglected, and no other industry is, or in the nature of things can be, so thoroughly organized, nation-wide, as the railways to co-operate in studying, experimenting and standardizing progress. But in view of the wonderful savings already accomplished, both major and minor, in the past few years, and the larger percentage of gross earnings absorbed by expenses and taxes, it is doubtful if the people should depend on such measures to offset the apparently irresistible rise in wages and in the price of materials, the higher cost of capital, and the demands for more elaborate facilities and luxurious service.

Country Must Be Served.—Are any of these obstacles sufficiently important to delay such revision of rate schedules as will meet this anomalous situation of increasing gross earnings, but declining net earnings, and still more rapidly declining net corporate income after payment of fixed charges?

The railway managers of the country want to know where to improve. They welcome just criticism based on real knowledge of all the facts. It is their purpose to profit by it. To serve the public adequately, on the other hand, is also their purpose, and it is their duty to seek diligently from the appropriate authorities the authority and help necessary, if the railway company is to do what the people want and must have if the country is to grow.

New England Situation.—For the New England lines that I represent, I ask the patient good-will of her people and of the nation while this peculiar and difficult problem is being solved, and I ask that all believe in our intention and desire to conform in good faith to the laws, state and national, when it is clear just what the laws are, and that there is no conflict between state and nation; and in our aim to serve the public interest to the extent of our ability—moral, mental, physical and financial. The tendency of rate regulation is toward a mileage basis, which must be modified to meet conditions such as exist in the United States—where many commodities must be moved long distances. This entails readjustment for many communities built up on well established rate relations. New England, owing to her geographical situation, would be crippled by the sudden and absolute application of a mileage basis.

New England's Value to Nation.—Those six states have one-fourteenth of the national population, but they have one-twelfth of the national wealth. They consume one-eighth of the materials of manufacture, and they have one-sixth of the bank deposits. New England appeals confidently to business men in other parts of the country to seek growth through the advantages they have rather than by attempting to force a readjustment which will involve serious consequences to New England and to the whole country, which benefits by New England's thrifty accumulation of capital, by her contributions to progress, by her very large purchases of the products of other regions, and by her great and persistent contribution to the national welfare in turning out trained men and women from her numerous educational institutions.

GOVERNOR COX'S ADDRESS.

Governor Cox outlined the policies which he believes should be followed by the government in its treatment of the railways. An abstract of his address follows:

Something must be done with the railroad question. If you lay your finger on the pulse of the railroad organism you have unmistakable symptoms of the country's prosperity or adversity. When Ohio was stricken last spring with the great flood catastrophe we lay stunned and helpless until railroad communication was established. None will deny how important it is to conserve this utility, and by this is meant protection from unwise legislation and a guarantee of measurable safety to the individuals and institutions that have hazarded their capital.

Now, what is the condition of the railroads? Tonnage continues stupendous. Terminals in every city are insufficient. There is congestion. Service is beginning to show a lack of old-time regularity. Rolling stock is inadequate. The development of the country makes a call on the railroads for extensions and equipment which finds an enforced feeble response. They could advantageously to the public use hundreds of millions of dollars right now.

Impaired Railway Credit.—The railroads cannot borrow the money to provide for the situation. Short time notes have been given to meet current and emergency expenses, and if the banks were to demand payment we should be in the throes of a panic. Investors have been driven to other fields, notwithstanding no business is based on a more stable utility than that of the railroads. The amount of securities listed on the New York Stock Exchange by steam railroads in 1912 was the smallest in 10 years.

You hear in many quarters the statement that adverse legislation and the policy of regulation are the largest contributing factors. I do not subscribe to this view. Sane regulation will become the ultimate salvation of the business. One cannot resist the thought, when he surveys the abuses of over-capitalization, financial adventure and personal exploitation, that the mistake in regulation has been that it did not come soon enough. No one will seek to condone the practice of milking railroads in order that executive officers and directors might be illegally and immorally given vast fortunes through the artful and insidious method of contracting with themselves for construction work. No man in conscience will avow the propriety of a wild cat policy in the issuance of securities. No community in America will produce the man who will attempt to justify the practices which have shaken the confidence of the conservative thought of New England.

Restore the Patient First.—We might just as well recognize, however, that a puritanical severity is not going to do any good. The thing to do is to restore the patient and then prescribe and enforce a diet and behavior which will prevent recurrent illness. Each age brings its changes in accepted fundamentals of justice. Our fathers subscribed to many things in full conscience that are shocking to present-day ideals. We must therefore be consistent and recognize this as fundamentally just—that the transgression of yesterday cannot and must not be measured with the ethical yardstick of today. It is more creditable to adhere to this doctrine than to frame a policy of confiscating the holdings of present owners who are in no way to blame for the abuse of those from whom they bought.

You cannot buy land, lay tracks, build lines to mines, cities or agricultural centers, without an increased cost in investment. You can't sell the securities unless the public is assured of a return on the investment. Every phase of the fiscal situation of the railroads suggests that something be done not only to establish in the minds of the investing public some fixed idea of the inherent value of the railroads, but to frame a national policy, securely supported by an intelligent public opinion, for the conservation of the transportation utilty. I introduce the suggestion that ultimate relief will never come until the Interstate Commerce Commission passes upon the issuance of securities. I spent a few days in Washington last week and heard everywhere the statement that the railroads would be given at once, without

a word, the desired raise in rate if the government were assured that the increased revenue would be properly applied. Ask the government to step in as a representative alike of the public, the railroads and the investor, issue securities of smaller denominations and in 10 years the great transportation lines will in fact belong to the people, and you will have public ownership rather than government ownership.

Living Rates Necessary.—Government, from the standpoint of morals and expediency, must permit the roads living rates. If it develops that while the gross receipts have increased, the net receipts are considerably diminished by the liberal policy of society, then relief ought to be granted, whether it be 1 per cent., 5 per cent, or 10 per cent. that is needed. There is nothing more harmful than the tendency to hold a fetish. There is no more offensive species of standpatism than to impose a rate one year and continue it without term.

Let us all dedicate ourselves to the solution of this great problem of transportation—recognizing that it concerns every community and every household. In the forum of public opinion every issue has been settled and ultimately settled right in this our glorious country. If progress means anything it is that prejudice cannot last and that fair dealing will endure.

USE OF INTERSTATE COMMERCE COMMISSION ACCOUNT NUMBERS FOR CORRESPONDENCE FILING.

By WILLIAM S. WOLLNER.

The use of Interstate Commerce Commission account numbers by all railroads has resulted in a larger number of employees becoming familiar with them than was the case when each road used its own system of accounts. Prior to July 1, 1907, if a man left the service of a road to accept a position with another, he found it necessary to learn an entirely new system of account numbers, and for that reason did not acquaint himself with them unless the proper performance of his duties required it. With the adoption of the uniform system of accounts by all roads, this is no longer true, and any person having to use accounts or statistics can well afford to memorize the account numbers, for as long as he remains in railroad service this knowledge will be of value to him.

It being practically necessary for most employees and officials to become familiar with the account numbers, it follows that these numbers should be used wherever possible in the office system. One place where they can be used with peculiar advantage is in the numbering of correspondence files, and this system of numbering proves of especial value where no file clerk is employed, as it enables any one who is familiar with the account numbers to find the file on any subject without consulting an index. Soon after the adoption of the uniform system of accounting, the writer of this article was called upon to install a filing system in the chief engineer's office of the Northwestern Pacific, and as this system has been in successful service for over six years he takes this means of recommending its use in similar installations.

In the use of this system each file subject is assigned a number containing four figures, the first two of which represent the subdivision of the road to which the file refers, and the last two the file subject. In the installation above referred to the road subdivisions were assigned the following numbers:

10—General
11—Willits North
12—Shively South
13—Healdsburg North
14—Wendling South
15—Corte Madera—Green Brae
16—River Landing—Monte Rio
17—Floodgate—Mill Creek

These subdivisions represent the different pieces of work undertaken and completed. As new work is started, it will be assigned numbers in consecutive order.

As above stated, the last two figures represent the file subjects and are the same as those furnished by the Interstate Commerce Commission for accounting purposes. Thus 01 represents engineering; 02, right of way; 03, real estate; 04, grading; etc., etc. Combining the subdivision numbers with the subject numbers, we have:

File 1106 = Willits North, Bridges.
File 1307 = Healdsburg North, Ties.
File 1712 = Floodgate to Mill Creek, Track laying.
File 1008 = Rails, General.
Etc., etc., etc.

It is not expected that the account titles given by the Interstate Commerce Commission will fill all the requirements of subject tiles, and two means of expansion are provided: First, any subject may be subdivided into as many files as are needed by the adoption of a modification of the decimal system. This method is best illustrated by the subdivision of file 1106 so as to provide a separate file for each structure:

File 1106 = Willits North, Bridges General.
File 1106-1 = First Crossing.
File 1106-2 = Second Crossing.
File 1106-3 = Third Crossing.
Etc., etc., etc.

There are only 48 construction account numbers provided by the Interstate Commerce Commission, while 99 general subjects can be used for each subdivision of road under this filing system. The second method of expansion is, therefore, to use the additional 51 numbers for subjects that may be arbitrarily selected to fit the needs of the user.

This system may be adapted to the use of the maintenance of way department offices by using the first two figures to represent section numbers in conjunction with the numbers provided by the Interstate Commerce Commission for roadway accounting purposes. Thus, 9904 will represent rails on section 99; 1114, telegraph lines on section 11; etc., etc.

In the master mechanic's office this system of filing proves of more value than in any other place, for with it locomotive and car numbers are used in connection with the Interstate Commerce Commission account numbers, and a historical record is thereby provided for every piece of equipment on the division. At first these numbers seem large to handle, but one readily becomes accustomed to them and finds that their use is not difficult. File 130125 contains a complete record of repairs to engine 1301, while file 106233 contains the depreciation figures for coach 1062.

As this system of filing is capable of being used in every general and division office, it readily adapts itself to the consolidation of offices or divisions. No special instruction is necessary for its use, and the ease with which file numbers may be applied to correspondence as well as the fact that any person who is familiar with the account numbers may locate letters without reference to a file index, recommends its use in large as well as small offices. It is the experience of all who have to do with filing systems that the more complicated they are the less attention is given to the proper filing of correspondence; officials and others oftentimes retaining letters and reports in their desks rather than entrust them to a file that will not produce them when they are required. With the use of the system outlined herein there need be no uncertainty as to subject numbers nor necessity for awaiting the return of a file clerk or stenographer before a letter can be produced, and the confidence thus established should insure many of the documents that now repose in officials' and employees' desks going into the general files where they will be available for easy reference by all those who have use for them.

STEEL TIES IN GERMANY.—Steel ties are the only kind, other than wood, used by the various railroads of Germany. The Baden system is constructed almost entirely with steel ties. In Bavaria and Saxony, on the other hand, there are few or none. In the Prussia-Hesse system, which comprises about 60 per cent. of the entire mileage of the empire, about one-third of the ties are of steel.. A more or less uniform type made of rolled steel, seems to have been agreed on as the best. In form it resembles a right-line arch, or, roughly, one-half an octagon. However, it is not equilateral, the upper or rail bearing side being about equal in length to one upright and one slanting side combined.

GRADE SEPARATION LAWS AND REQUIREMENTS.

Abstract of 27 State Laws on This Subject and Discussion of Practice in Cities Where the Most Work Has Been Done.

[With an Inset.]

A number of state legislatures have exercised their power to supervise the building of crossings of railways with highways at grade and to require the elimination of such grade crossings when public convenience or safety demands it, either by passing specific laws on these subjects or by delegating the power to deal with them to public service or railway commissions. The railways have realized the desirability of avoiding grade crossings as far as possible in new construction and of eliminating the existing crossings on lines which were built when cheap construction was essential and the necessity for separating grades was less urgent, and in general, they have not sought to prevent grade separation legislation. In some recent cases, however, where legislation on this subject has seemed unfair, railway managers who were directly interested have taken steps to influence such legislation along more reasonable lines.

GENERAL PROVISIONS OF STATE LAWS.

The principle which has been most generally recognized in state laws providing for the elimination of grade crossings is the delegation of this power to the state commission or regulating body, leaving the decision as to the necessity for any given piece of work and the apportionment of cost of such work among the benefited parties largely, or wholly, to such commission. This principle has proved effective in practice, and the amount of work accomplished in states where it is in force has been very satisfactory both to the railways and the people. In view of the present trend in legislation, which seems to be toward the mandatory elimination of all crossings at the sole expense of the railways, a resume of the existing practice will be timely.

Some form of legislation has been passed in nineteen states looking to the gradual elimination of existing crossings of highways by railways at grade. These laws generally refer to the manner of determining the necessity for undertaking grade separation work and to the manner of apportioning its cost. One typical law provides that the state railway commission shall have entire charge of this work, hearing petitions either from the railway, municipality, street railway, county, highway commissioners, or other interested parties, or investigating upon its own motion the advisability of undertaking the necessary work to separate grades at a given crossing. In other cases, the law requires the elimination of a definite number of grade crossings each year, and in one state a special commission is created for each case to be considered.

As to the manner of apportioning the cost, the laws differ considerably. In Arizona, California, Michigan, North Carolina and Wisconsin, full power is delegated to the commission to apportion the cost according to the equities in each particular case. This principle recognizes the obvious fact that the relative advantage to the railway, municipality, street railway and public at large, may vary considerably in different cases. In other states the law denies the commission the exercise of this discretion, and fixes definite proportions to be followed in all cases. The states which specify the basis of division of costs are Connecticut, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Vermont and Washington. Of these, New Hampshire and New Jersey are the only ones which impose the entire cost upon the railway under all conditions. In Connecticut the entire cost is paid by the railway, providing the petition to separate grades is made by the railway. In case the petition is made by the municipality, the latter may be assessed one-fourth of the expense at crossings of highways in existence before the railway was built and one-half at crossings of highways which were built across the railway.

In New York the principle of priority is also recognized by the provision that when a new railway is constructed across an existing highway above or below grade, the entire expense shall be borne by the railway, whenever a new street is constructed across an existing railway the railway company and the municipality shall divide the expense equally, and whenever a change is made in an existing crossing, the railway shall pay 50 per cent., the municipality 25 per cent., and the state 25 per cent. In Washington, the railway pays the entire cost when it crosses over or under an existing highway, and in all other cases it bears a portion of the cost, which is determined for each crossing according to the equities of the case. The other states in the above list specify a percentage of the cost which shall be paid by the railways under varying conditions, as given more fully in the abstract of laws herewith.

In Connecticut the railways are required to remove at least one grade crossing each year for every 50 miles of road operated within the state, and in Vermont, one for every 80 miles or fraction thereof exceeding 40. In some states, such as Illinois and Oklahoma, the railway commissions have proceeded to order and supervise the elimination of grade crossings under the general powers delegated to them for the regulation of the railways. In Oklahoma, such an order has been upheld on appeal to the Supreme Court. In some states, such as Virginia, Iowa and South Carolina, the law provides that the railway companies may enter into agreements with county authorities, municipalities, road commissioners, etc., for the elimination of grade crossings without delegating to any state body the power to force such action on the part of the railways. With a view to preventing the construcion of grade crossings as far as possible, three states, Arizona, South Carolina and Washington, have passed laws requiring railway companies to secure permission from the state railway commission for each crossing that it is desired to establish at grade on a new line.

ABSTRACT OF STATE LAWS.

The following abstract of state laws is taken in part from one compiled by the secretary of the Massachusetts Board of Railroad Commissioners, having been amplified in several instances by correspondence with the state commissions.

Arizona.—No grade crossings of a railroad and highway can be established without the permission of the corporation commission. The commission may alter or abolish any railroad, street railroad or highway crossing, or require the separation of grades, prescribing the proportions of the expense to be paid by the railway, the state, the municipality or other public authority interested.

Connecticut.—Local authorities or the directors of a railway company may petition the Public Utilities Commission in writing for the alteration of a highway grade crossing and after notice and hearing, the commission can determine what alterations should be made and by whom. If the petition is brought by the railway, the commission shall order the expense, including all damages, to be paid by the railway company. If the petition is brought by the municipality it may order that municipality to pay one-quarter of the expense if the highway affected was in existence when the railway was constructed across it at grade or the layout of the highway was changed for the benefit of the railway, and half of the expense if the highway has been constructed since the railroad which it crosses at grade, the railway paying the balance of the cost in both cases. Each railway in the state shall remove at least one grade crossing each year for every 50 miles of road operated in the state. If the company fails to observe this provision, the commission may order the removal of such crossings as it thinks should have been applied for by the railway. In the absence of an application, the Public Utilities Commission may, after a hearing on reasonable notice, order alterations in any grade crossing and may apportion the cost, provided that, in such cases, the state shall pay one-quarter of the expense, including damages, the remainder being charged to the railway, and, provided further, that not more than one crossing per year be so eliminated on any one railroad.

California.—The railroad commission has the exclusive power to alter or abolish a grade crossing and prescribe the proportions in which the expense of the alteration or separation shall be divided between the railroad, street railroad, state, county, municipality, or other public authority in interest.

Indiana.—The railroad commission is authorized to examine all grade crossings in the state, and collect complete information from railway companies, requiring surveys of such crossings if it is deemed expedient. Whenever it is concluded from the data at hand that the grades at any crossing should be separated, the commission has power to order the railway company to carry out the work. The commission prescribes the manner in which the separation shall be accomplished, the cost being borne crossing annually in each county, nor of more than one crossing for each one-quarter by the county and three-quarters by the railway. The commission can not order the separation of grades at more than one highway 200 miles or fraction thereof of the line of any railway in the state. The commission can not order any plan of grade separation which would require a grade on a steam railway track exceeding the established ruling grade on that operating division without the consent of the railway nor heavier than 2 per cent. on any street railway. Permission must be secured from the commission to establish a new grade crossing.

Iowa.—The state law gives cities with a population of 7,000 or over the power to require any railway company operating tracks across any public streets of the city to build and maintain viaducts providing the railroad commissioners pass on the necessity and the plans for such structures. No company can be required to build more than one such viaduct in any one year. Damages are paid by the city and by implication it appears that the entire cost of the viaduct must be paid by the railway. When the tracks of two or more railways are to be crossed by a viaduct, the city council, after a notice and hearing, determines the proportion of cost to be borne by the two companies. When a new railway desires to cross an established highway or when a new highway is to be built across an established railway, or when any citizen, any county board of supervisors or any railway company petitions for a separation of grades, the Railroad Commission, after notice and hearing, determines the necessity for such separation and the division of the expense. Any portion of the expense borne by a city, town, county, state, or other public body, must be considered as a trust held by the railway which cannot be considered as a part of the value of the company's property upon which it is entitled to receive a return.

Kansas.—The mayor and council of cities are given the power to require railways to build and maintain viaducts or subways to carry streets over or under tracks where it is deemed necessary for the convenience or safety of the public. The entire cost of the work including property damages must be borne by the railway.

Maine.—Petitions may be filed with the Railroad Commissioners by local authorities requesting separation of grades. The commissioners, after notice and hearing, shall determine what change is necessary and shall apportion the expense between the state, the town in which the crossing is located, and the railway, the state paying 25 per cent., the town 10 per cent. and the railway 65 per cent. When more than one railway is involved in such work the cost is divided between them according to the judgment of the commission. The amount to be paid by the state for such work in any one year is limited to $15,000, which is paid from the annual railroad tax. When a street railway uses a crossing at which a separation of grades is made it can be assigned an equitable share of the expense.

Maryland.—There is no provision of law in Maryland for the elimination of grade crossings but for some time the commission has been gathering data on this subject with a view to recommending such legislation.

Massachusetts.—A special commission of three disinterested persons is appointed by the supreme court to consider petitions for alterations to, or eliminations of, grade crossings and to apportion the cost of such work between the railway, municipality and county, it being specified that 65 per cent. of the total cost be apportioned among the interested railroads, not more than 15 per cent. to any street railway which may be interested, and the remainder between the state and the municipality, the latter's share being not more than 10 per cent. A proposed amendment to this law provides that the amount apportioned to a municipality shall depend upon the benefit to the municipality and also upon its ability to pay, as it is held that in many cases 10 per cent. of the total cost is an excessive amount to apportion to a small municipality.

Michigan.—Under the state law, grade crossings can be eliminated by agreement between the railway company and a common council of the city, the board of supervisors of a county, or the township commissioner of highways; such agreement to provide for the division of expense and subsequent maintenance. In case of failure to reach an agreement, any of the interested parties may petition the railroad commission whose duty it is to investigate the necessity for separating grades at the crossing, determine the manner of performing the work if it is necessary, and apportion the cost.

Minnesota.—The commission is given authority to require the construction of an overhead bridge at least 18 ft. wide at crossings which, after proper hearings, have been found dangerous, provided the railway has been built or its grade lowered after the laying out of the highway and that the tracks are 7 ft. or more below the natural surface of the ground.

Missouri.—When a new railway is built across any road or street at a grade 10 ft. or more higher or lower than the surface of the highway, the company may be required to provide a suitable crossing for the highway either under or over the tracks.

Nevada.—The railroad commission has no power to order the elimination of grade crossings except by implication, and the commission's powers in this direction have never been defined.

New Hampshire.—A railway company may apply to the commission for authority to raise or lower a highway for the purpose of abolishing a grade crossing and a municipality may vote to require a railway company to abolish a crossing, the entire cost of the work in either case falling upon the railway. So far as is known, there is only one case in which a municipality has voted to require the abolition of a grade crossing, and in that case on appeal to the commission an agreement was made to divide the expense, 65 per cent. to the railway, 23 per cent. to the state, and 12 per cent. to the municipality.

New Jersey.—The Board of Public Utilities Commissioners may order a railway company to alter or eliminate a grade crossing according to plans approved by the commission. The entire expense, including damages, is paid by the railway unless a street railway uses the crossing, in which case the board may order the street railway to pay not more than 10 per cent. No municipality can construct a street across existing railway tracks and no railway can lay tracks across an existing street at grade without the permission of the Board of Railroad Commissioners.

New York.—When a new railway is built across an existing highway above or below grade, the expense of the crossing is paid entirely by the railway. When a new highway is built across an existing railway, the railway pays half and the municipality half of the expense. Whenever a change is made in an existing crossing on petition either of the municipality or railway, 50 per cent. of the cost of the work is paid by the railway, 25 per cent. by the municipality, and 25 per cent. by the state. In case the new highway built over a railway is a state highway, half of the cost is borne by the state, and when it is a county highway, half of the cost is borne jointly by the state, county and town, the other half being paid by the railway in both cases. The Public Service Commission may institute proceedings on its own motion in the absence of an application for alteration in an existing grade crossing, the changes ordered by the commission in any one year being so distributed among the railways and municipalities as to produce such equality of burden upon them as the circumstances will permit.

North Carolina.—The Corporation Commission has power to require the raising or lowering of any tracks or highway at a grade crossing and to designate who shall pay for the work.

Ohio.—The cost of separating grades, including the cost of property purchased and damages to abutting property, is borne 35 per cent. by the municipality and 65 per cent. by the railway. The council of a municipality may require the separation of grades by ordinance.

Oklahoma.—The Corporation Commission has exercised its general authority to order the construction of overhead crossings and these orders have been complied with by railway companies.

Oregon.—No grade crossing can be established without the consent of the Railroad Commission.

Rhode Island.—In case a railway refuses to eliminate grade crossings at the request of a municipality an appeal may be taken to the Public Utilities Commission, which has authority to order such work if it appears necessary. The proportion of the cost to be borne by the railway and municipality is decided by the court.

South Carolina.—The railways are prohibited from crossing another railway without consent in writing of the commissioners and from crossing highways so as to obstruct the same. The railway is empowered to raise or lower highways in order to secure separate grade crossings but it must first secure a decree from the county commissioners or other local authorities.

Tennessee.—The city of Memphis was empowered to require the grades of certain streets to be separated by the railways crossing them. It was specified that the railway companies bear all the expenses including the cost of the approaches and the damage to abutting property.

Vermont.—Petitions for elimination of grade crossings may be brought before the Public Service Commission by a municipality or a railway, the commission's order allotting to the state not more than 25 per cent. of the cost of the work, including damages; to the municipality not more than 10 per cent., and the remainder to the railway. If the highway affected has been built since the railroad which it crosses at grade, the commission may order the state to pay an amount not exceeding 25 per cent., the municipality 15 per cent. and the railway the remainder. Every railway operating more than 80 miles of single track road in the state must remove at least one grade crossing every year for each 80 miles or fraction thereof exceeding 40; one of these crossings to be that, which in the opinion of the commission, is among the most dangerous upon the company's lines.

Virginia.—When the change necessary to eliminate a grade crossing is to be made in the railway it shall be made and paid for by the railway company. When the change is to be made in the highway, it shall be made by the railway and the expense borne equally by the railway and the county or municipality. Whenever the work to be done cannot be agreed upon by the railway and local authorities, it shall be passed on by the state corporation commission.

Washington.—No railway can construct a grade crossing over another railway or highway without the authority of the commission to do so. When it is desired to cross a railway or highway at grade, a written petition must be presented to the commission setting forth the reasons why such crossing cannot be made either above or below grade and if,

after investigation, the commission finds it is not practicable to separate grades, a written order is granted giving the right to construct the grade crossing. A municipality, county or railway may petition the commission to alter an existing grade crossing, or in the absence of such a petition, the commission may proceed on its own motion. When a new railway is built over an existing highway, the entire expense of the crossing is paid by the railway. When a new highway is built across a railway or an existing grade crossing is eliminated, the cost is apportioned by the commission between the railway and the municipality or county affected, or if the highway is a state road, between the railway and the state according to the benefits accruing to the interested parties. When the commission orders the elimination of a grade crossing it may at its discretion pay an amount not exceeding 10 per cent. of the cost out of a stated appropriation for that purpose. In case two or more railways are involved in the elimination of a grade crossing, the apportionment between the railways shall be made by the commission if the companies are unable to reach an agreement themselves.

Wisconsin.—On petition of a municipality or railway or an action by the commission itself, the Railroad Commission of Wisconsin has authority to determine what alterations are necessary in a grade crossing and to fix the proportion of the cost to be paid by the interested parties.

GENERAL REQUIREMENTS OF CITIES.

Since the necessity for grade separation is most urgent in large cities, the most important work of this kind has been done in a comparatively small number of places. Railway managers are so frequently confronted with demands for improvements of this nature, some of which are not altogether reasonable, and in some cases it is such a difficult matter to show a municipality that its demands are unjust or unwise, that the following brief compendium of the practice in the cities in which the largest amounts of grade separation work have been carried out has been collected and tabulated to indicate the trend of practice in this work and the limits between which individual cases have varied.

The replies received from important cities show that the policy of handling such work under contract ordinances between the railway and the city is preferred in most cases. In 15 of the cities heard from such contract ordinances have been agreed to as compared with 8 which have passed mandatory ordinances. It is known, however, that in some of the cases reported as mandatory, acceptance clauses were provided which practically made them contract ordinances. In only five cases was the work done under the direct order of a state commission or court. The total cost of the work as given in the accompanying table is very likely to be misleading, and is presented only as a general indication of the amount of work undertaken in the different cities. In many cases the elimination of grade crossings has been carried on in connection with the building of new terminals, the relocation of line or other general improvements which greatly complicated the work and made the division of costs difficult. In addition to this it is impossible to be certain that the figures given are in all cases the total cost of the grade separation, as in some cases the work is still under way and only estimates can be made, and in other cases some portions of the cost borne by other interested parties may be omitted in the report. However, these figures of approximately $140,000,000 for the work under way or completed, and more than $25,000,000 for proposed work, show very clearly that grade separation has assumed very impressive proportions. The cost per crossing for those cities reporting costs averages $197,000,although this figure is also somewhat inaccurate no doubt, for the reasons explained The unit cost of eliminating grade crossings on the Pennsylvania Railroad in New Jersey was given by President Rea as $73,000, but this difference is no doubt due to the fact that these crossings included many in small towns and rural districts where the topography favored the elimination and the cost was very low.

The division of costs among the interested parties shows a wide variation in practice. It is customary to make the division on a percentage basis, although in some cases, notably in Milwaukee, definite parts of the work have been assigned to the various parties on a basis of equity. In only two states represented in the table (Massachusetts and New York), has any portion of the cost been borne by the state. In the case of Toronto, the Dominion government assumed a small portion of the cost. The largest percentage borne by the state is in Massachusetts where, in a number of instances, it has paid 31.5 per cent. of the cost. In 19 cases the cities have paid a part of the cost of the work, their share reaching 50 per cent. for portions of the work in New York and Cleveland. The railways have paid the entire cost in eight cities, and the minimum proportion borne by the railways in any city is 39 per cent. The street railways have participated in the cost in very few cases, except in paying for changes to their own lines necessitated by the improvements. Changes to water and sewer mains are paid for either by the railway, the city, or jointly by the two. In general, the changes to public utility companies mains and conduits are paid for by the corporation owning these utilities. In five cases the entire cost of such changes is charged to the total cost of the work and divided in the same proportion as the cost of construction. In two cases the cities assumed the entire cost of these changes. The damages to abutting property are paid by the city in four cases, by the railway in one case, and are charged to the cost of the work in six cases. In the remaining instances some other division between the railway and the city was agreed upon. It is usually conceded that the city can secure a more equitable adjustment of damage claims than the railways.

The clearances at subways and viaducts are very important, as they affect the plan of elimination to be adopted. In general, three methods of elimination are in use: the elevation of the streets without change of the track level; the elevation of the tracks without change of the street level; and the partial elevation or depression of the tracks, with a corresponding depression or elevation of the streets. The elevation of the tracks has a number of points in its favor which are well recognized by engineers, and which have been the cause of the adoption of this method either in its entirety or with some modifications for a large percentage of the work that has been undertaken. When the railway is carried over the street it is necessary to separate grades about 17 ft. to allow 14 ft. for head room and 3 ft. for depth of floor. When the railway is carried under the street the grades must be separated at least 25 ft. to allow 22 ft. for head room and 3 ft. for depth of floor. A clearance of 22 ft. is not always required, but even with a clearance as low as 16 ft. the required separation is 19 to 20 ft. The clearance shown in the table for subways with street railways varies from 13 ft. to 16 ft. 6 in., and for subways without street railways from 11 ft. to 14 ft. The clearance under viaducts ranges from 15 ft. 6 in. to 22 ft. 6 in. The latter clearance is required by the Canadian Railway Act, which provides that every bridge over a railway shall have a clearance of at least 7 ft. above the top of the highest freight car, such clearance never to be less than 22 ft. 6 in. above base of rail, except with the approval of the board. The roads entering Toronto made a strong appeal for a 19 ft. clearance under subways built in 1911 along the water front, but the commission denied the request and ordered the standard clearance to be provided.

The grades adopted for the railway and for the streets are very closely related to the clearance and type of structure. As shown in the table the street grades vary within wide limits. Three per cent. is the lowest grade which has been fixed as a maximum in any city; 3.5 to 4 per cent. being more usual. Many cities allow 5 to 7 per cent., however, and in cases where steeper grades exist in adjacent streets, much higher values have been allowed, the maximum reported being 12 per cent. Most cities adopt some maximum allowable change in street level, but like the grades, this value is extremely variable. In a number of cases it is specified as from 4 to 10 ft., although the maximum value runs up to 21 ft. The railway grades are, of course, much more important, as they may affect the rating for an entire engine district. In a number of cases grades exceeding 1 per cent. have been used, the maximum reported being 1.244 per cent.

VARIATION IN TYPES OF STRUCTURES.

The structures used for grade separation work are far from being standardized, and some railways that have had consider-

State and City.	Contract or mandatory ordinance.	Cost of work. Under way or completed. Elevation.	Under way or completed. Depression.	Proposed. Elevation.	Proposed. Depression.	Proportion of total work completed or under way.	Percentage of cost borne by State.	City.	Railway.
	1	2	3	4	5	6	7	8	9
ILLINOIS—									
Chicago	Contract.	$70,000,000 up to January, 1912.	Very little.	Figures not available.	None	Cannot estimate.	0	0	100
Joliet	Contract.	$2,500,000 approx.		None		100 per cent.	0	0	All but street railway share.
INDIANA—									
Indianapolis	Contract in past. Order in future.	$1,300,000	.....	$6,300,000 ordered.	.....	Total done and ordered, about 35% of total in city.	State—None. County—6 with, 8 without street rys.	14 with, 17 without street rys.	75
MASSACHUSETTS—									
Boston	Mandatory.	$10,620,799 to December, 1911.		None		100 per cent.	10—31½	10—34	39—65
Brockton	Mandatory.	$2,249,983		None		100 per cent.	25	10	65
Dedham	Mandatory.	.....	$405,073	None		100 per cent.	25—31½	10—13½	55—65
East Boston	Mandatory.	.....	$1,400,000	None		100 per cent.	30	20	50
Fall River	Mandatory.	$1,580,051		None		100 per cent.	25	10	65
Hyde Park	Mandatory.	$1,369,252 to December, 1911.		None		100 per cent.	25—31½	10—13½	55—65
Lynn	Order of court.	$1,600,000	.....	None		100 per cent.	17½	10	65
Newton	Order of court.	None	$2,895,552	None		100 per cent.	25	10	65
MICHIGAN—									
Detroit	Contract.	$2,000,000	None	Indefinite.		Indefinite.	.....	About 30	About 70
MISSOURI—									
Kansas City	Contract.	$747,890	$831,220	$4,765,280	$2,144,660	Elev. 14% Dep. 28%	None	None	All but street railways share.
NEBRASKA—									
Lincoln	Contract.	.....	$250,000	.....	$120,000	.....	None	None	All but paving street railway tracks.
NEW JERSEY—									
Newark	Contract.	$5,760,000		$1,600,000		All main line crossings abolished.	None	21.8 one case. 20 one case.	All but appropriation by city.
NEW YORK—									
Buffalo	Contract.	$11,358,582 to October, 1912. Work still under way.		Cannot estimate.		Cannot estimate.	None	25 one case. 35 one case.	75% one case. 65% one case.
New York	Contract or order of P. S. C.	$7,500,000		$3,725,000		.....	25 when ordered. None when contract.	25 when ordered. 50 when contract.	50
OHIO—									
Cleveland	Contract.	$7,583,000		.....		.....	None	0, 35 and 50	50, 65 or 100
Columbus	Contract.	$1,600,000	$500,000	$2,500,000	None	40 per cent.	None	35, shared with street railway in some cases.	65
PENNSYLVANIA—									
Pittsburgh	Contract.	$386,000	.....	$1,250,000	.....	.....	None	⅓ + 30% of (⅓—$70.000)	⅓ + 70% of (⅓—$70,000)
RHODE ISLAND—									
East Providence	Contract.	.....	$90,000	.....	.....	30 per cent.	.....	.....	100
Providence	Contract.	Not available.		No new work ordered.		.....	None	25—40	60—75
Westerly	Contract.	Not available.		.....	.....	.....	None	Fixed sum.	Balance
WASHINGTON—									
Spokane	Mandatory with acceptance clause.	$3,000,000	.....	.....	.....	.....	.....	.....	100
WISCONSIN—									
Milwaukee	R. R. Com. order.	None		$3,000,000	.....	.....	.....	Street approaches.	100 within right of way except st. ry.'s share.
CANADA—									
Toronto	Board of Ry. Com. order.	$883,900		$959,700		25 per cent.	Fixed amount.	24.4	74.6

RESUME OF CITY REQUIR

	Percentage of cost borne by			Clearances required. Subways.					Width of	
ate.	City.	Railway.	Street railway.	With street railway.	Without street railway.	Viaducts.	Intermediate supports allowed?		Sidewalk.	Roadway.
7	8	9	10	11	12	13	14		15	16
0	0	100	0	13 ft. 6 in.	12 ft.	.....	Curb or center of street.		Subway width same a	
0	0	All but street railway share.	Cost of changing grade in subways.	13 ft. 6 in.	12 ft.	.....	Three.		12 ft.	42 ft.
—None. —6 with, t street rys.	14 with, 17 without street rys.	75	5	14 ft. 6 in. city. 15 ft. 9 in. int.	12 ft. 11 ft. in 3 cases.	21 ft.	Roadway 30 ft. or less, curb supports only. Over 30 ft., three supports.		Full width of sidewalk	
—31½	10—34	39—65	13—15	13 ft.—16 ft. 3 in.		15 ft. 6 in.—18 ft.	Three for long spans.			Same
25	10	65	.....	15 ft.—16 ft. 6 in.	13 ft.—14 ft.	17 ft. 9 in.—18 ft.	No			Same
—31½	10—13½	55—65	.....	.....	13 ft.	18 ft.	No		Same as original street, except	
30	20	50	Changing own tracks.	.....	.....	15 ft. 6 in.—16 ft.	.....			Same
25	10	65	.....	.....	14 ft.	17 ft. 3¼ in.— 18 ft. 3 in.	Street center for long spans.			Same
—31½	10—13½	55—65	.....	15 ft.	.....	18 ft.	No			Same
17½	10	65	7½	14 ft.—15 ft.	12 ft., 13 ft., and 14 ft.	18 ft.	Street center at two crossings.		.....	.....
25	10	65	Part of one crossing.	.....	.....	16 ft.	.....		.....	.....
.....	About 30	About 70	By agreement with railway.	14 ft.	13 ft.	.....	On curbs.		10 ft.	46 ft.
None	None	All but street railways share.	50% of cost of viaducts used by cars.	14 ft. 2 in.	13 ft.	Std. 22 ft. Min. 18 ft.	Three supports for ordinary widths; 4 in some cases.		Min. 6 ft.	Min. 24
None	None	All but paving street railway tracks.	Paving	.....	.....	22 ft.	Where necessary.		.....	.....
None	21.8 one case. 20 one case.	All but appropriation by city.	None	13 ft.	12 ft. 6 in.	16 ft. 6 in. Min.	Only at curbs.		.....	.....
None	25 one case. 35 one case.	75% one case. 65% one case.	Changing own tracks.	13 ft.—14 ft.	12 ft.—13 ft.	15 ft.—21 ft.	Curb and center.		.....	32 ft.—42
n ordered. en contract.	25 when ordered. 50 when contract.	50	Changes in own tracks.	14 ft.	14 ft.	16 ft. 6 in.	Clear spans if possible. Curb supports if necessary.		Full roadway width require	
None	0, 35 and 50	50, 65 or 100	None	14 ft. 6 in.— 15 ft.	12 ft.—13 ft.	Usual 21 ft. Min. 16 ft. 3 in.	At curbs in some cases.		.....	.....
None	35, shared with street railway in some cases.	65	Not to exceed 50% of city's share.	14 ft. 6 in. city. 16 ft. int.	13 ft.	21 ft.	Curbs only.		Abutments on lot lines.	
None	⅓ + 30% of (⅓—$70.000)	⅔ + 70% of (⅓—$70,000)	$70,000	14 ft.	14 ft.	21 ft.	Curbs, not to exceed 18 in. deep.		Carried through on	
.....	.....	100	.....	.....	.....	18 ft.	.....		.....	.....
None	25—40	60—75	None	Min. 14 ft.	Min. 14 ft.	Min. 18 ft.	Curbs.			Full width
None	Fixed sum.	Balance	None	.....	14 ft.	.....	Curbs.		10 ft.	.....
.....	.....	100	.....	14 ft. 6 in.	12 ft.	.....	Curbs and street center.		.....	.....
.....	Street approaches.	100 within right of way except st. ry.'s share.	Work within its outside rails.	13 ft. 6 in.	12 ft.	.....	Curbs and street center.		12 ft.—15 ft.	42 ft.—4
l amount.	24.4	74.6	None	14 ft.	14 ft.	22 ft. 6 in.	Center.		.....	.....

QUIREMENTS FOR GRADE SEPARATION WORK.

Width of street in subway.			Subway floors. Depth.				Maximum grades subway or viaduct approaches.	Payment for changes to public utilities.
oadway.	Total.	Original.	Maximum.	Average.	Minimum.	Ballasted?		
16	17	18	19	20	21	22	23	24
same as original street in most cases.			Rail to clearance, 3 ft. 6 in.			Yes	3.5 per cent.	Public utility companies pay for own mains and conduits. Railway pays for sewers and water mains.
42 ft.	66 ft.	.....	.....	3 ft. 6 in.	.....	Yes	3.5 per cent.	Same as Chicago.
sidewalk and roadway through subways.			5 ft.	3 ft. 9 in.	1 ft. 6 in. Not on main tracks.	Yes	Usually 3.5%. 5% in some cases.	Disputed in courts. City contends companies should pay.
Same as original street.			5 ft. 1⅝ in.	3 ft. 10 in.	2 ft. 8⅛ in.	Yes for 15 of 29 steel bridges.	4.75 per cent.	Companies pay for own mains and conduits. Railways pay for sewers and water mains.
Same as original street.			4 ft. 8 in.	3 ft. 6⅛ in.	2 ft. 5¾ in.	No	9.58 per cent.	Same as Boston.
, except one case 35 ft. subway on 40 ft. street.			3 ft. 1¼ in.	2 ft. 6⅝ in.	2 ft.	No	5 per cent.	Same as Boston.
Same as original street.			.....	.....	.....	.....	2.59%—6%.	According to percentage of other work.
Same as original street.			4 ft.	3 ft. 2 15/16 in.	2 ft.	No.	12 per cent.	Same as Boston.
Same as original street.			.....	4 ft. 6½ in.	.....	.....	5 per cent.	Same as Boston.
.....	.....	.....	3 ft. 11 in.	.....	3 ft. 4 in.	Yes and No	5 per cent.	Companies pay for own mains. Sewer and water changes divided same percentage as other work.
.....	.....	.....	.....	.....	.....	.....	9.13 per cent.	Same as Lynn.
46 ft.	66 ft.	66 ft.	.....	3½ ft.	.....	Yes	3.00 per cent.	Companies pay for changes to their lines. Railways for sewer and water mains.
Min. 24 ft.	Min. 32 ft.	80 ft.	.....	.....	.....	Yes	6.38 per cent.	Railway pays all.
.....	.....	.....	.....	.....	.....	.....	5 per cent.	.....
.....	.....	.....	.....	.....	2 ft.	.....	6 per cent.	City paid for all changes.
ft.—42 ft.	50 ft.—66 ft.	66 ft.	3 ft. 6 in.	.....	1 ft. 6 in.	Generally	About 4%.	Owning companies pay their costs. City and railway pay sewer and water main changes.
required. Sidewalks may be narrowed if traffic permits.			5 ft.	.....	3 ft. 6 in.	Yes	Some 5%. Usually 3%.	Included in cost of work.
.....	.....	.....	.....	.....	.....	Yes	Some 6%. Usually 4%.	Owning companies pay their costs. Sewer and water changes charged to cost of work.
lines. Original width of street not changed.			4 ft.	3 ft. 9 in.	3 ft.	Yes	3.5 per cent.	Owning companies pay their costs.
ugh on established curb and street lines.			.....	.....	.....	Yes	4 per cent.	Owning companies pay their costs; sewer and water main changes part of work.
.....	.....	.....	.....	.....	.....	.....	7 per cent.	Railway pays where no contract exists as to location of mains.
ll width of streets and walks.			.....	.....	.....	Yes	4 per cent.	Owning companies pay costs.
.....	50 ft.	50 ft.	.....	3 ft. 9 in.	.....	No	5 per cent.	Owning companies pay costs. Railway pays for cities' pipes, wires, etc.
.....	.....	.....	.....	.....	3.4 ft.	Yes	5 per cent.	Owning companies and railway.
ft.—46 ft.	66 ft.—76 ft.	66 ft.—76 ft.	.....	.....	.....	.....	4½ per cent.	City.
.....	60 ft.	66 ft.	.....	.....	.....	Yes	5 per cent.	Charged to work.

ENTS FOR GRADE SEPARATION WORK.

in subway.		Subway floors. Depth.				Maximum grades subway or viaduct approaches.	Payment for changes to public utilities.	Restrictions as to type or orna
Total.	Original.	Maximum.	Average.	Minimum.	Ballasted?			
17	18	19	20	21	22	23	24	25
nal street in most cases.		Rail to clearance, 3 ft. 6 in.			Yes	3.5 per cent.	Public utility companies pay for own mains and conduits. Railway pays for sewers and water mains.	Must be steel or concrete. O only at boulevards.
66 ft.	.....	.....	3 ft. 6 in.	.....	Yes	3.5 per cent.	Same as Chicago.	Plate girders.
roadway through subways.		5 ft.	3 ft. 9 in.	1 ft. 6 in. Not on main tracks.	Yes	Usually 3.5%. 5% in some cases.	Disputed in courts. City contends companies should pay.	Floor must be waterpro
inal street.		5 ft. 1⅝ in.	3 ft. 10 in.	2 ft. 8⅛ in.	Yes for 15 of 29 steel bridges.	4.75 per cent.	Companies pay for own mains and conduits. Railways pay for sewers and water mains.	Stone arch or steel girder
inal street.		4 ft. 8 in.	3 ft. 6⅛ in.	2 ft. 5¾ in.	No	9.58 per cent.	Same as Boston.	Stone arches.
ise 35 ft. subway on 40 ft. street.		3 ft. 1¼ in.	2 ft. 6⅝ in.	2 ft.	No	5 per cent.	Same as Boston.	Half through plate gi
inal street.		.....	.....	.....	.....	2.59%—6%.	According to percentage of other work.	Steel bridge, solid floor, brick State R. R. Com. Specs. Dece
inal street.		4 ft.	3 ft. 2 15/16 in.	2 ft.	No.	12 per cent.	Same as Boston.	Half through riveted truss and
inal street.		.....	4 ft. 6½ in.	.....	.....	5 per cent.	Same as Boston.	Stone arch and plate g
.....	.....	3 ft. 11 in.	.....	3 ft. 4 in.	Yes and No	5 per cent.	Companies pay for own mains. Sewer and water changes divided same percentage as other work.	Specified by Com. Confirme
.....	.....	.....	.....	.....	.....	9.13 per cent.	Same as Lynn.	No restrictions as to d
66 ft.	66 ft.	.....	3½ ft.	.....	Yes	3.00 per cent.	Companies pay for changes to their lines. Railways for sewer and water mains.	No restrictions.
Min. 32 ft.	80 ft.	.....	.....	.....	Yes	6.38 per cent.	Railway pays all.	No restriction or orname
.....	.....	.....	.....	.....	.....	5 per cent.	.....	.....
.....	.....	.....	.....	2 ft.	.....	6 per cent.	City paid for all changes.	Structures must be approved Public Works.
50 ft.—66 ft.	66 ft.	3 ft. 6 in.	.....	1 ft. 6 in.	Generally	About 4%.	Owning companies pay their costs. City and railway pay sewer and water main changes.	None
ewalks may be narrowed if traffic its.		5 ft.	.....	3 ft. 6 in.	Yes	Some 5%. Usually 3%.	Included in cost of work.	Must be steel, concrete or com sign subject to approval Mur
.....	.....	.....	.....	.....	Yes	Some 6%. Usually 4%.	Owning companies pay their costs. Sewer and water changes charged to cost of work.	No restrictions.
l width of street not changed.		4 ft.	3 ft. 9 in.	3 ft.	Yes	3.5 per cent.	Owning companies pay their costs.	Girders with ornamentation or section with baluste
ned curb and street lines.		.....	.....	.....	Yes	4 per cent.	Owning companies pay their costs; sewer and water main changes part of work.	Very little. Art Com. recer
.....	.....	.....	.....	.....	.....	7 per cent.	Railway pays where no contract exists as to location of mains.	None
eets and walks.		.....	.....	.....	Yes	4 per cent.	Owning companies pay costs.	None
50 ft.	50 ft.	.....	3 ft. 9 in.	.....	No	5 per cent.	Owning companies pay costs. Railway pays for cities' pipes, wires, etc.	None
.....	.....	.....	.....	3.4 ft.	Yes	5 per cent.	Owning companies and railway.	.....
66 ft.—76 ft.	66 ft.—76 ft.	.....	.....	.....	.....	4½ per cent.	City.	.....
60 ft.	66 ft.	.....	.....	.....	Yes	5 per cent.	Charged to work.	Board's specificatio

or ornamentation.	Maximum amount of street depression or elevation. 26	Maximum grades for railway track. 27	Railway grade crossings eliminated. 28	Street and railway grade crossings eliminated. 29	Number of openings through tracks per mile. 30	Abutting Damages. 31
ete. Ornamentation levards.	No max. fixed. Usual practice up to 4 ft.	No maximum fixed.	11 to July, 1911.	780 to July, 1911.	Varies.	City pays damages recovered at law.
ders.	4 ft.	0.5 per cent.	6	13	Average 6	City assumes liability.
waterproofed.	One case 8 ft. 3 in. Most cases 6 ft.	1.0 per cent.	1	17	.....	Courts ruled no damages can be collected except for property taken.
l girder bridge.	15 ft.	1.19 per cent.	None	29	Not fixed.	By agreement and award of jury.
rches.	10 ft. 4 in.	0.85 per cent.	None	14	Not fixed.	By agreement and award of jury.
plate girder.	15 ft. 6 in.	0.7 per cent.	None	4	Not fixed.	By agreement and award of jury.
, brick and concrete, cs. December, 1901.	Raised maximum 11 ft.	0.795 per cent.	1	9	.....	Railway paid damages caused by track changes. City paid damages caused by street changes.
uss and plate girder.	11 ft.	0.75 per cent.	None	14	No definite number.	By agreement and award of jury.
plate girder.	6 ft.	1.00 per cent.	None	4	No definite number.	By agreement and award of jury.
onfirmed by court.	13 ft.	0.70 per cent.	None	8	.....	Court settlement if parties cannot agree.
as to details.	Lowered 10 ft. Raised 15 ft.	1.06 per cent.	.....	.....	.....	Charged to cost of work.
ctions.	About 12 ft.	"Practically level."	7	31	Not specified.	City pays.
ornamentation.	17 ft.	1.1 per cent.	None	4	11	Paid by railway.
.....	.....	.....	2	2	.....	.....
pproved by Board of Works.	.....	1.146 per cent.	.....	68	.....	Divided equally, city and railway.
ıe	About 10 ft.	.....	.....	69	.....	One plan—City, 50 per cent.; ry., 50 per cent. One plan—City, 55 per cent.; ry., 45 per cent.
or combination. Deval Mun. Art Com.	10.25 ft.	1.244 per cent.	None	10	No requirement.	Part of cost of work.
ictions.	21 ft.	Not to exceed ruling grade.	None	35	.....	Part of cost of work.
tion or through floor baluster.	Maximum 12 ft. Avg. 6 ft.—8 ft.	0.5 per cent.	None	30	6—10	Part of cost of work.
n. recently created.	10 ft.	.....	1	1	.....	Charged to work.
ıe	.....	0.4 per cent.	0	3	.....	By agreement.
ıe	.....	1 per cent.	0	10	As many as needed	Charged to work.
ıe	14 ft.	.....	0	1	.....	By agreement.
.....	.....	0.8 per cent.	0	15	.....	Some by city, some by railway.
.....	.....	.....	.....	12	.....	City pays.
cifications.	0.0	0.4 per cent.	0	7	.....	.....

able experience in this line are still using a number of types, the choice between these types depending principally on local conditions. Steel structures have been used in by far the largest number for both subways and viaducts, although in many cases these have been provided with concrete decks or concrete facia girders for ornamentation. Subways of reinforced concrete are quite generally used on a number of roads, and their slight additional initial cost is thought justifiable by many engineers. In some portions of the country stone arches have been used on account of the availability of that material. In almost all of the cities the full width of the sidewalk and roadway of the original street is required to be provided through a new subway or over a viaduct, especially on narrow streets. Some cities allow some contraction of the width on wide streets, or in cases where traffic does not seem to demand the full width. As the depth of a subway floor influences directly the amount of separation between the grades that is necessary, some subways with very shallow floors have been built, although except in cases where the depth of floor would affect the ruling grade, the deeper floor is generally used. The variation in depth shown in the table is from 1 ft. 6 in. to 5 ft. 1⅝ in. The tendency to provide all subways with ballasted decks to insure a solid, easy riding track and to reduce the noise, is shown by the fact that in 12 cities the subways have all been provided with ballasted decks, in three others part of them have been ballasted and in only four cases are they built without ballast. The prohibition of intermediate supports in subway spans has limited the design of the structures in a number of cities as this increase in span length makes impractical some types of structures, as for instance, reinforced concrete. In most of the cities where considerable work has been done the railways have been able to show the municipality that some intermediate supports would not seriously interfere with street traffic, however, and in only three cases shown in the table are intermediate supports entirely prohibited. In three other cities they are allowed only on the center line of the street; in eight on curb lines only, and in nine on curb lines and center of the street.

Very little has been done in the way of limiting the type of structures by ordinance or forcing the railways to provide ornamentation for such structures. There has been considerable agitation from some sources on account of the unsightly character of subways and viaducts, and railways have done much to improve the general appearance of these structures. It seems to be the general policy, however, to effect this improvement by adopting a design that will provide more pleasing lines than by adding features intended purely for ornamentation. In some concrete structures, surface treatment has been attempted with varying degrees of success, but on steel structures very little has been done with the exception of substituting a pleasing color of paint for the ordinary dark red or black. In New York and Philadelphia all structures must be approved by the Municipal Art Commission, and in Pittsburgh an art commission has recently been created which doubtless will influence design in that city in the future.

ROLLING STOCK IN DENMARK.—The rolling stock in Denmark at present is estimated at about 681 locomotives, 470 locomotive tenders, 1,628 passenger cars, 465 mail and baggage cars, 9,670 freight and livestock cars, and 47 wrecking cars, etc. There are 70 snow plows, and 8 steamships belonging to the railways, and 23 ferry steamers for the transportation of railway cars.

AN AMERICAN PASSENGER CAR IN SWEDEN.—The American passenger coach is unknown in Sweden. Some years ago a car builder in one of the shops of an important private railway, who had spent some time in American shops, attempted to introduce the American passenger coach. He built a car along American designs and installed imported plush-covered seats from the United States, but the people did not like the innovation, and the experiment has not been repeated.

LIGNITE COAL TESTING PLANT.*

A plant is about to be erected by Saskatchewan government at Estevan, Sask., for the purpose of developing and testing the lignite coal of that district. The plant will be in charge of S. M. Darling, a gentleman who has had a wide experience in this line. The following short account of what he has accomplished with North Dakota lignite is especially interesting to us in view of the fact that the lignites of Southern Saskatchewan and of North Dakota are of the same cretaceous character.

The chemical composition of these lignites precludes their being successfully briquetted in their natural condition. To market the lignite commercially in a large way it must be destructively distilled, carbonized or partially carbonized and the resulting gas, oil or tar, ammoniacal liquor and carbon residue utilized separately.

Analysis of a large number of samples of North Dakota lignite averaged on a dry basis: volatile matter 40.67, fixed carbon 53.33, ash (practically no sulphur) 6.00.

On carbonization, the products per ton of lignite in round numbers are:

Gas	10,000 cu. ft.
Oil or tar per ton	20 gals.
Ammoniacal liquor	35 gals.
Carbon residue	1,200 lbs.

The Gas. The yields of gas and oil depend largely upon the temperature and rate of carbonization. With a high temperature and quick carbonization the yield of gas will be high and of oil low; while with a lower temperature, and longer time in which to carbonize, there will be less gas and more oil.

The gas has a heating value of 450 B. t. u. per cubic foot. It contains a good percentage of illuminants, but has about 15 per cent. of carbon dioxide, which almost entirely destroys the illuminating power. This carbon dioxide can be removed by passing the gas through lime, but the process is too expensive for commercial application. The gas can be used as an illuminant by burning it in a mantle, but it is serviceable principally for fuel and power.

There is more gas in one ton of lignite than is required to carbonize the next ton. In practice only sufficient gas is removed to supply the requisite fuel to carry on the process. The remaining portion of the volatile is left to add heating value to the carbon residue. There is therefore no charge for fuel in the process.

The Oil. On distillation the oil yields:

Light oils, benzine, toluene, etc	11.5 per cent.
Carbolic, oils, some napthaline	11.5 per cent.
Creosote oils	36.1 per cent.
Anthracene, some paraffine	18.4 per cent.
Pitch, hard	22.4 per cent.

This oil or its distillates can be put to many use—fuel oil, creosoting oil, leather preservative, waterproofing, pitch, etc. Upon exhaustive distillation it yields aniline dyes, carbolic acid, and in varying proportions all the other coal tar products.

The Ammoniacal Liquor. The liquor yields some acetate of lime, or if desired acetic acid, and about 15 lbs. of sulphate of ammonia per ton of lignite. There is a growing market for all of these materials, particularly the sulphate, as fertilizer.

The Carbon. The lignite crumbles on carbonization, which renders possible a continuous carbonizing process, obviating the laborious charging and drawing of retorts, as practiced in coal gas plants.

The cretaceous lignites retain largely their original woody structure, and hence do not break up so finely during carbonization. After removing by means of screens the small percentage of fines after carbonization, there remains practically lump charcoal of one-half to two inches in size. This can be used in gas producers, under boilers, and for domestic purposes. This lump charcoal is of about the same analysis as anthracite and has about the same heating value, but is not so dense in structure and therefore has somewhat more bulk per ton than the anthracite.

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*Reprinted from the *Public Service Monthly*, Regina, Saskatchewan.

The fines have to be briquetted, or still further pulverized and burned as powdered fuel*, a practice which is rapidly gaining favor.

Actual briquetting and burning tests of this fuel in car load lots demonstrate that satisfactory briquettes can be made with not to exceed 2 per cent. of starch and 6 per cent. of coal tar or lignite pitch as binder.

The briquettes burn with a short flame, no odor, no smoke and no clinker. They can be used wherever anthracite of bituminous coal is burned. They retain their structure in the fire until completely burned. They do not disintegrate or lose value in the weather, and can therefore be shipped any distance without loss.

The lignite coke is an ideal gas producer fuel. A satisfactory gas producer generating gas for power purposes from fuels containing a large amount of volatile, as does the raw lignite, is not available. But with the volatile removed, this lignite coke, transformed into producer gas and used in a gas engine to generate electricity, effects an enormous saving over the present method of producing electricity by means of boilers and steam engines. The gas producer requires only about one-fourth the fuel necessary with boiler and engine to produce an equal amount of horse power. This producer gas also is an exceptionally good fuel for burning brick, tile, etc.

To defray the cost of carbonizing and briquetting there is the revenue from the by-products and it is known that the income from this source will at least meet that charge. But aside from this, there is to be derived from this carbonizing process the enormous benefit afforded by the possibility of mining and shipping lignite the year round, because the product is put into a condition which prevents deterioration no matter how long the fuel is stored or how far it is shipped.

*Mr. Darling expects to get a railway fuel from this lignite dust.

TRAIN INDICATORS AT CHARING CROSS.

In the Charing Cross Terminus of the South Eastern & Chatham Railway, in London, the interior arrangements in the waiting rooms, ticket offices, etc., have lately been entirely rebuilt, and in connection with the improvements there has been put up a new train indicator, a photographic reproduction of which is shown herewith. The indicator is immediately above the gate leading from the ticket offices to the train shed, in the most favorable position to be seen by all outgoing passengers.

The indicator is similar to that at the Euston station of the London & North Western, heretofore described in these columns, and, apparently, is an improvement on that, in that a larger number of trains can be shown at one time.

The peculiarity of this indicator is that, with the minimum of manipulation, all of the trains of immediate interest can be shown, in large letters, while at the same time the legends for the trains not wanted are entirely concealed. This is accomplished by putting the inscriptions on cloth curtains, carried on horizontal rollers, one at the top and one at the bottom.

In the view here shown the indicator displays the announcements of all outgoing trains from 3:38 p. m. to 6:05 p. m., and the destinations of each train are set forth at considerable length. The two curtains shown are exact duplicates of each other; but that at the right hand has been rolled up one step farther than the other. Thus 17 trains are shown without extending the placard to the inconvenient height that would be necessary for that number if all the trains were to be listed in a single vertical column. After the departure of the 4:47 train both curtains can be rolled up one step; then the left hand will show the trains which now appear at the right, and the right hand curtain will show the next 8 or 9 trains. The figures at the right, on the curtain, indicate the platform numbers.

A German Bridge-Testing Car.—A few years ago the matter of providing better facilities for the purpose of testing bridges was taken in hand by the Breslau Railway Directorate, and the result is seen in the introduction of a special bridge-testing car. An old fourth-class coach was converted into a specially equipped car, the interior being divided into two compartments, the larger of which contains the appliances and instruments used in making the tests, while the smaller one serves as an office, in which the results of the tests are worked out.

DEPARTURE OF TRAINS FROM THIS STATION.
3.38 NEW CROSS and all Stations to LADY WELL, CATFORD, BECKENHAM, HAYES & ADDISCOMBE Rd 3
3.40 NEW CROSS and all Stations to BLACKHEATH (for BEXLEYHEATH Branch) WOOLWICH, ERITH & DARTFORD 6
4. 0 GREENWICH, MAZE HILL, WESTCOMBE PARK, CHARLTON, WOOLWICH & PLUMSTEAD 6
4. 2 NEW CROSS and principal Stations to CHISLEHURST, SEVENOAKS, TONBRIDGE, TUNBRIDGE WELLS & MADHURST 3
4.20 NEW CROSS and all Stations to BLACKHEATH, WOOLWICH, ERITH & DARTFORD 6
4.40 GREENWICH, MAZE HILL, WESTCOMBE PARK, CHARLTON, WOOLWICH & PLUMSTEAD 6
4.42 LEWISHAM, LADY WELL, CATFORD and all Stations to BECKENHAM & ADDISCOMBE Rd 5
4.47 NEW CROSS and all Stations to ELTHAM, SIDCUP, BEXLEY, DARTFORD, GRAVESEND, CHATHAM, GILLINGHAM & MAIDSTONE 3
5. 0 NEW CROSS and all Stations to BLACKHEATH (for BEXLEYHEATH Branch) WOOLWICH & PLUMSTEAD 6
5. 2 NEW CROSS, St JOHNS, HITHER GREEN, GROVE PARK, SUNDRIDGE PARK & BROMLEY NORTH 2
5.20 GREENWICH, MAZE HILL, WESTCOMBE PARK, CHARLTON, WOOLWICH & PLUMSTEAD 6
5.30 EAST CROYDON, PURLEY (for CATERHAM Branch) and all Stations to REDHILL, READING & TONBRIDGE 3
5.38 NEW CROSS and all Stations to LADY WELL, CATFORD, BECKENHAM & ADDISCOMBE Rd (Also to HAYES Branch) 5
5.40 NEW CROSS and all Stations to BLACKHEATH (for BEXLEYHEATH Branch) WOOLWICH, ERITH & DARTFORD 6
5.50 NEW CROSS and all Stations to ELTHAM, SIDCUP, BEXLEY & DARTFORD 4
6. 0 GREENWICH, MAZE HILL, WESTCOMBE PARK, CHARLTON, WOOLWICH & PLUMSTEAD 6
6. 5 NEW CROSS and all Stations to SEVENOAKS, TONBRIDGE, ASHFORD, TUNBRIDGE WELLS, St LEONARDS & HASTINGS 3
4 3

Bulletin of Departing Trains, Charing Cross Station, London—South Eastern & Chatham Railway.

THE PROBLEM OF BOX CAR DESIGN.

Effect of Dead Weight on Net Earnings; Standard Rolled Sections Versus Pressed Shapes for Steel Body Framing.

At the meeting of the Railway Session of the American Society of Mechanical Engineers, December 3, George W. Rink, mechanical engineer, Central Railroad of New Jersey, presented a paper on Steel Underframe Box Cars, an extract from which was published in the *Railway Age Gazette,* December 5, 1913, page 1081. In the absence of R. W. Burnett, general master car builder of the Canadian Pacific, the paper on Steel Frame Box Cars, which was abstracted in the *Railway Age Gazette,* December 5, 1913, page 1075, was read by H. H. Vaughan, assistant to vice-president, Canadian Pacific. The papers were discussed by H. H. Vaughan, Canadian Pacific; B. D. Lockwood, chief engineer, Pressed Steel Car Company; W. F. Kiesel, Jr., assistant mechanical engineer, Pennsylvania Railroad; O. C. Cromwell, mechanical engineer, Baltimore & Ohio; E. G. Chenoweth, mechanical engineer, Rock Island Lines; W. S. Atwood, chief engineer, Canadian Car & Foundry Company, and C. A. Seley, American Flexible Bolt Company. Extracts from the discussion follow:

CONSIDER AVERAGE SERVICE IN DESIGNING CARS.

H. H. Vaughan.—I feel that Mr. Burnett's paper has, unintentionally, to a large extent referred to what Mr. Rink has said about the standard car. Personally I feel that Mr. Burnett's position, that with the structural steel car we have to all intents and purposes a car that is standard as far as any car can be standard, is a sound one. I do not believe that we are ever going to adopt one standard type of car or one standard design of car and build it indefinitely. There are sure to be improvements and alterations that the different roads think it desirable to make, and if we had a standard car tomorrow the next order that was let would have a few changes from it. If we use standard material that can be obtained without difficulty, and keep to certain standards on the parts that both Mr. Rink and Mr. Burnett have mentioned, I think that we are going as far as we can go in the direction of a standard car.

I quite agree that the draft castings, arch bars, bolsters and some of the other parts should be standardized to a greater extent than at present. It does seem absurd that the slight variations made in these parts should necessitate their being obtained from the car owners, when repairs are to be made on foreign lines, and that serious delays should ensue on account of these parts not being available.

We have been a good deal criticized on account of certain features in the design of the Canadian Pacific car, such features as I think Mr. Rink refers to when he says there was not very good engineering carried out in the design of the steel underframe. Some of the features of our underframe design were not altogether a question of engineering, but largely governed by a feeling I had that if you make a thing plenty strong enough you never lighten it, but that if you make a new design a little fine and then strengthen it at the weak points, you will finish up with a considerably lighter design than if you started out with some arbitrary figures and made everything plenty strong enough to start with.

In designing a car what must be considered is the service in which it is generally going to run, not the service in which it may run. We estimated that 60 per cent. to 75 per cent. of the service to which the box cars are put, both in Canada and in the United States, is service in which the old type of underframe will stand up perfectly satisfactorily. I feel that that assumption is justified by the results we have had. If there was any decided weakness in this type of car we would certainly have found it out in five years. The fact that we have had 14 or 15 cars destroyed on foreign lines indicates that, while the construction may not be as strong as would be desirable for some service, it is strong enough for the average service in which the cars are used. I do not believe today that it is a good commercial proposition to put weight in a car for occasional service.

The omission of the end braces and the corner braces has been discussed. The center sills and the side sills have ample strength to hold up the corners of the cars under general conditions, and the saving of 500 lbs. weight there, and 500 lbs. in the cover plate, and a few hundred pounds here and there, is what has made the car as light as it is.

Attention should be drawn to the effect of reduced weight on net earnings, and not on the cost per ton mile. The Canadian Pacific figures for 1913 show that we carried 22.34 tons per loaded car mile, and our light car mileage was 28.5 per cent. of the loaded car mileage. That gives an average load of 16.8 tons per car mile total. I have not the average car weight, but I do not think we are far off in taking it to be 18 tons; the average weight of the car loaded was then 34.8 tons. I do not believe that figure is out of the way for a large number of roads in this country handling general traffic. We have a large amount of grain, and while we do not have much coal our average load is fairly good.

Supposing the car weighed one ton more. Without any question as to whether we would always change our train rating, the weight of the car loaded would be 35.8 tons instead of 34.8; in other words, there would be an increase in the ton mileage of 2.85 per cent. Or suppose we were operating on a ratio of 70 per cent., under this changed condition of weight we would be operating on a ratio of 72 per cent. Our net tons would fall from 30 per cent. to 28 per cent., which is a difference of 6 per cent.; in other words, while we have only changed 2 per cent in our cost of transportation, we have changed about 6 per cent. in our net earnings, and net earnings are what we are after. It does not take very much of a change in transportation matters to make quite a change in net earnings. It takes less than it does to make a change in gross earnings. Even supposing that one-half the time the weight of the car makes no difference, it depends on how tonnage is handled; on the Canadian Pacific, on which a large percentage of the traffic is on grades over .6 per cent., tonnage is what we are after. If we are within a certain number of tons of the right load we take it, and if it is less than that we put on another car. Taking only half, the handling of a ton makes a difference of one per cent. in the expenses and 1⅕ per cent. in the net earnings. Taking the size of the car, and only taking one-half of the actual difference in weight, we find that it amounts to about $12 per ton per year. That is only assuming that one-half the difference in weight makes any difference. We can do a good deal on a lot of cars with $12 per ton per year.

The question of weight is something which must be looked after carefully in car design; we must not give all our attention to designing a car that is cheap to keep up and which will not need repairs, but try to design a car that is most economical for the railroad company in handling its traffic. It may cost $5 or $10 a car more per year to keep up, but it will save two or three times that in the weight that is being hauled about uselessly.

In reference to vertical or horizontal sheathing, Mr. Burnett stated that there were a number of cars which were quite open. We have had a lot of cars which have shrunk to an extent to cause us a great deal of anxiety, but we have had singularly few cases of damage claims on account of it. The planks are all shiplapped, and when looking at a car it would almost seem possible to see through the openings. But it is not difficult to tighten them, and the only reason we have not done so is because we have not had sufficient complaints to justify our taking the cars out of service and doing the work. The vertical sheathing would be, possibly, a preferable arrangement if it could be accompanied by an economical and convenient design of side framing. The

truss form of side framing naturally lends itself to horizontal sheathing. We are using very extensively the same style of end for repairs of all-wood box cars that we use on the steel frame car, simply putting in two Z-bars, reinforcing the ordinary end post, and putting the ¾ in. lining outside.

SPECIFICATION OF MINIMUM STRESSES.

B. D. Lockwood, chief engineer of the Pressed Steel Car Company, stated that he believed the railways should specify the minimum stresses allowable in box car frames in order that builders may have something definite to work to.

RATIO OF STRESS TO STRAIN.

W. F. Kiesel, Jr.—There is one feature in Mr. Rink's calculations for end strength to which he has not especially called attention, and that is the ratio of stress to strain under end shock. The important point to consider is that at the bolster. This ratio in the cars enumerated varies between .033 and .118. The high figures are due to the great distance between the center line of the drawbar and the neutral axis of the sills. The area of the center sills at the bolster varies from 19.08 to 36.18, and the average is 24.75. Without using any additional material in the center sills the ratio of stress to strain can readily be reduced in many of these cars to the advantage of the strength of the car.

The authors of both papers seem to favor the Z-bar posts and braces because they are made of rolled material, and, as stated by them, can be readily obtained. This does not seem a good argument, as it is well known that standard sections of rolled material cannot always be obtained on short notice; in fact, within the past year the steel mills have quite frequently reported that certain angles, etc., could not be furnished under three or six months, as there was no stock on hand and they did not expect to put in the rolls for that length of time. Advocates of pressed steel for this purpose assert that pressed steel posts and braces are lighter per unit of strength, because they can be formed to the required shape; that they can be formed with sufficient surface at the ends for the number of rivets required to develop their full strength, while Z-bars and other rolled forms require gusset plates for this purpose; that they are not likely to be damaged by pushpoles, and if damaged in wrecks, can be readily straightened and restored to approximate shape; and that when absolutely necessary to replace them they can readily be obtained from the car owner or builder, without waiting for any special rolling of material.

All of the 14 cars enumerated by Mr. Rink have so-called box-girder center sills, and the majority of them have a minimum section of about 24 sq. in. With this section area a ratio of stress to strain of .06 can be obtained, provided proper adjustment is made for the relative location of the neutral axis of the center sills and the center line of the draft gear. It would, therefore, seem that the present designs of box cars corroborate the recommendations of the Committee of Car Construction of the Master Car Builders' Association and that those recommendations are reasonable and conservative. A thorough knowledge of cars by the motive power officials of railroad companies will, I hope, lead them to ultimately endorse the M. C. B. recommendations.

DIAGONAL BRACES IN END FRAMING.

O. C. Cromwell.—Side and end posts and braces, corner posts and door posts, should be brought down to a standard; they are now very nearly this.

The height of the floor above the rail is an important point, and there should be no good reason why we should have a variation 6¾ in. in this height. This also affects the height of the truck, as if it is desired to work toward standard and interchangeable truck parts, the height of the truck is an important one to bear in mind.

I observe that no diagonal braces are used in the end framing of the Canadian Pacific steel frame car, such as are generally used in the end of a wooden frame car. These braces tend to keep the end framing of the car square. While their omission would probably not be apparent for the early life of the car, should we not expect to find, as the car ages, a loosening of the riveted joints uniting the posts with the plates and underframe? While the car is new, the end sheathing will serve to keep the framing straight, but will we not in time experience loosening of these end boards through shrinkage?

We know that on gondola cars the side planks decay under the side stakes and under the corner bands. May we not, as the cars become older, experience a similar action of the lumber in this character of car? Would not this in turn lead to the loosening of the framing?

The Baltimore & Ohio built, in 1862, some iron box cars. These cars had wooden underframes, but the body and roof were made of iron plates. The cars proved unsatisfactory because in the summer they became so excessively heated that they spoiled the merchandise, and in sudden changes of weather produced sweating, with damage to the lading. They had finally to be withdrawn from service.

LOW WEIGHT NOT THE MAIN CONSIDERATION.

E. G. Chenoweth.—I believe that we are now about at the minimum weight of box cars and that the tendency is to increase, and not worry so much about the extra dead weight hauled, but to give more consideration to keeping the car in revenue service more days of its life instead of having it stand on repair tracks.

Mr. Rink states that it is the whim of the designer that occasions so many different lengths of box cars. In my experience in designing equipment for several different railways the proper length of a car was held as a serious question and good reasons were developed in the freight traffic department before the designer received the principal dimensions from which to work.

The standardization of a design of box car will have a tendency to decrease the variation in weight. Of two designs of car built within a year of each other by different railways one, a 60,000-lb. capacity car, had a light weight of 48,000 lbs. while the other, of 80,000-lb. capacity, had a light weight of 36,000 lbs. Moreover, both railways were satisfied with their designs.

The trouble experienced by water following beading or grooves in horizontal sheathing and then passing into the car could, I think, readily be overcome by beveling the top outside corner of each board. This would eliminate the gutter effect of the sheathing where it is not entirely tight.

DIFFICULTY IN SECURING SUITABLE LUMBER OVERCOME.

W. S. Atwood.—The first steel frame car which we built was considerably heavier than the present ones, weighing 41,000 lbs. This was partly due to the fact that the car was constructed from material which was in stock, no special material having been ordered. The present car weighs less than 36,000 lbs.

With the first cars of this type there was some difficulty experienced in securing the proper grade of lumber and also in properly drying it, as, owing to its thickness, it had to remain in the dry kilns longer than was necessary in the case of the thinner sheathing used on the outside sheathed car. On this account the car companies were not, in all cases, equipped with sufficient dry kiln capacity. The lumber dealers, however, have met the car builders in attempting to prepare a satisfactory grade of lumber and no difficulty is now encountered.

The adoption of a car with standard inside dimensions would be a matter of considerable importance to the car builders, as material could be stocked and would be available for building cars required for quick delivery for any of the railways which had adopted this type of car.

ALL-STEEL BOX CARS.

C. A. Seley.—About 15 years ago three factors influenced some progressive railroads toward the larger introduction of steel in the frame work of freight cars. These were, increased capacities, greater structural strength to withstand operating stresses, and the approaching equalization of costs of steel and car lumber, particularly for framing. My own idea is that steel under-

frames should be confined to the strengthening and rebuilding of the present wooden superstructure house cars. For new cars, I believe there is now no good argument against steel for the complete framing, so combined that the sides will assist in carrying the load. The question then arises as to how far to go with the use of steel for such parts of the car as merely contain or shelter the load. Manifestly, floors must continue to be made of wood to enable blocking of the lading. In my opinion, steel will be the ultimate construction used in box cars, but doubtless it will be slow in general adoption on account of the still favorable balance in favor of the cost of wood for lining and sheathing, and in combination with steel plate for roofing. When the all-steel box car does come, it will have to be arranged with ventilation features to prevent damage to lading from sweating and from accumulation of excessive heat which may unfavorably affect many high grade commodities.

Both writers have discussed the advisability of the standard car. I doubt very much if this idea will ever be consummated, even to the extent of the standard material idea advanced by Mr. Burnett. The Master Car Builders' Association has standardized the parts essential to interchange, and the government has standardized safety appliances, but we all know that very few of the M. C. B. standards are really standard in exact detail, and the Interstate Commerce Commission safety appliances necessarily give considerable range of dimensions and application within which their requirements may be fulfilled.

CHICAGO PASSENGER TRAFFIC.

Some interesting tables showing the daily passenger traffic in and out of Chicago by train, car and passenger movements. have been collected by Bion J. Arnold, consulting engineer, and are included as a statistical appendix in his report on the Chicago terminal situation presented to a city council committee on November 18. The tables, published herewith, show that the Illinois Central handles the largest suburban traffic, with 40,757 passengers a day, the North Western the second largest, with 32,583, and the Rock Island the third, with 16,424. The Chicago, Milwaukee & St. Paul handles the largest through passenger traffic, a total of 7,156 daily, and the Illinois Central has the largest combined passenger traffic. The tables follow:

DAILY PASSENGER TRAIN MOVEMENT.
Chicago Passenger Stations.

Stations and Roads.	Through.			Suburban.			Grand
Union—	In.	Out.	Total.	In.	Out.	Total.	Total.
C. B. & Q.	15	16	31	33	30	63	94
P. C. C. & St. L.	10	10	20	..	..	..	20
P. Ft. W. & C.	18	20	38	10	6	16	54
C. & A.	10	10	20	..	..	..	20
C. M. & St. P.	27	31	58	17	16	33	91
Total	80	87	167	60	52	112	279
Grand Central—							
B. & O.	7	7	14	2	2	4	18
C. G. W.	4	4	8	..	..	..	8
P. M.	6	6	12	..	..	..	12
Total	17	17	34	2	2	4	38
C. & N. W.	..	..	..	..	..	..	..
Total	60	61	121	96	93	189	310
La Salle—							
L. S. & M. S.	17	20	37	18	18	36	73
C. R. I. & P.	16	15	31	38	37	75	106
C. I. & S.	3	3	6	..	..	..	6
N. Y. C. & St. L.	3	3	6	..	..	..	6
Total	39	41	80	56	55	111	191
Dearborn—							
A. T. & S. F.	7	8	15	..	..	..	15
C. & W. Ind.	..	..	..	11	11	22	22
G. T.	7	6	13	4	4	8	21
C. & O.	3	3	6	..	..	..	6
C. & E. I.	12	11	23	2	3	5	28
Monon	8	8	16	..	..	..	16
Erie	7	5	12	..	..	..	12
Wabash	10	9	19	3	4	7	26
Total	54	50	104	20	22	42	146
Illinois Central—							
I. C.	17	17	34	143	145	288	322
Soo Line	7	7	14	..	..	..	14
M. C.	15	14	29	..	..	..	29
C. C. C. & St. L.	4	4	8	..	..	..	8
Total	43	42	85	143	145	288	373
Grand total	293	298	591	380	372	746	1337

DAILY PASSENGER CAR MOVEMENT.
Chicago Passenger Stations.

Stations and Roads.	Through.			Suburban.			Grand
Union—	In.	Out.	Total.	In.	Out.	Total.	Total.
C. B. & Q.	133	126	259	151	135	286	545
P. C. C. & St. L.	65	65	130	..	..	..	130
P. Ft. W. & C.	119	115	234	32	19	51	285
C. & A.	64	66	130	..	..	..	130
C. M. & S. P.	205	139	344	60	53	113	457
Total	586	511	1097	243	207	450	1547
Grand Central—							
B. & O.	40	40	80	7	6	13	93
C. G. W.	26	26	52	..	..	..	52
P. M.	37	37	74	..	..	..	74
Total	103	103	206	7	6	13	219
C. & N. W.	394	391	785	424	421	845	1630
La Salle—							
L. S. & M. S.	139	138	277	88	89	177	454
C. R. I. & P.	75	104	179	174	166	340	519
C. I. & S.	18	12	30	..	..	..	30
N. Y. C. & St. L.	23	22	45	..	..	..	45
Total	255	276	531	262	225	517	1048
Dearborn—							
A. T. & S. F.	46	54	100	..	..	..	100
C. & W. Ind.	..	..	..	31	29	60	60
G. T.	42	43	85	22	24	46	131
C. & O.	10	10	20	..	..	..	20
C. & E. I.	78	77	155	6	12	18	173
Monon	39	41	80	..	..	..	80
Erie	45	31	76	..	..	..	76
Wabash	58	43	101	6	8	14	115
Total	318	299	617	65	73	138	755
Illinois Central—							
I. C.	113	111	224	626	619	1245	1469
Soo Line	41	41	82	..	..	..	82
M. C.	118	105	223	..	..	..	223
C. C. C. & St. L.	26	27	53	..	..	..	53
Total	298	284	582	626	619	1245	1827
Grand total	1954	1864	3818	1627	1581	3208	7026

DAILY PASSENGER MOVEMENT.
Chicago Passenger Stations.

Stations and Roads.	Through.			Suburban.			Grand
Union—	In.	Out.	Total.	In.	Out.	Total.	Total.
C. B. & Q.	2195	2200	4395	7120	5140	12260	16655
P. C. C. & St. L.	934	1218	2152	..	..	..	2152
P. Ft. W. & C.	1329	1482	2811	498	303	801	3612
C. & A.	1227	1404	2631	..	..	..	2631
C. M. & St. P.	3568	3588	7156	1644	1618	3262	10418
Total	9253	9892	19145	9262	7061	16323	35468
Grand Central—							
B. & O.	340	310	650	210	260	470	1120
C. G. W.	185	306	491	..	..	..	491
P. M.	1141	893	2034	..	..	..	2034
Total	1666	1509	3175	210	260	470	3645
Total C. & N. W.	8300	8511	16811	17000	15583	32583	49394
La Salle—							
L. S. & M. S.	1909	2651	4560	4242	4052	8294	12854
C. R. I. & P.	2292	2160	4452	8160	8264	16424	20876
C. I. & S.	299	379	678	..	..	..	678
N. Y. C. & St. L.	368	326	694	..	..	..	694
Total	4868	5516	10384	12402	12316	24718	35102
Dearborn—							
A. T. & S. F.	1000	1000	2000	..	..	..	2000
C. & W. I.	..	..	..	2699	2126	4825	4825
G. T.	631	635	1266	1172	1175	2347	3613
C. & O.	240	215	455	..	..	..	455
C. & E. I.	1750	1745	3495	300	400	700	4195
Monon	442	420	862	..	..	..	862
Erie	450	450	900	..	..	..	900
Wabash	560	430	990	185	280	465	1455
Total	5073	4895	9968	4356	3981	8337	18305
Ill. Central—							
I. C.	2365	2525	4890	20696	20061	40757	45647
Soo Line	410	404	814	..	..	..	814
M. C.	1507	1254	2761	..	..	..	2761
C. C. C. & St. L.	875	800	1675	..	..	..	1675
Total	5157	4983	10140	20696	20061	40757	50897
Grand total	34317	35306	69623	63926	59262	123188	192811

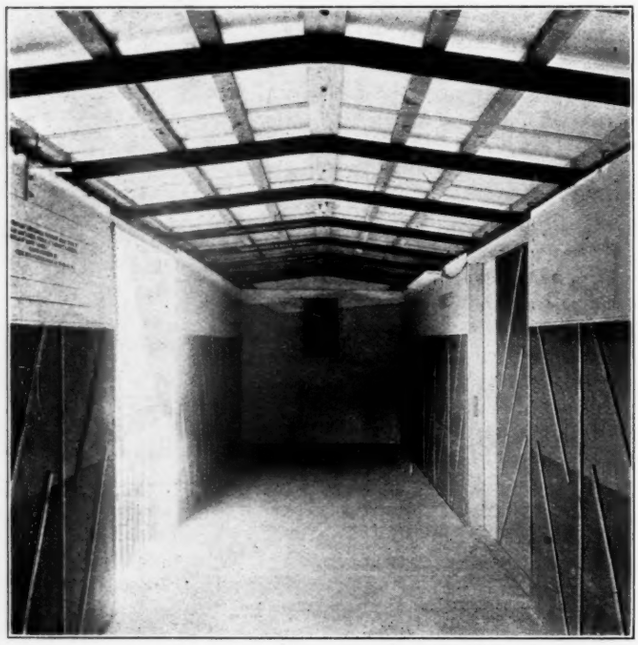
A summary showing the total traffic in daily train, car and passenger movements by station groups is as follows:

SUMMARY OF RAILROAD PASSENGER TRAFFIC—TOTAL DAILY TRAIN, CAR AND PASSENGER MOVEMENTS.
Chicago Passenger Stations.

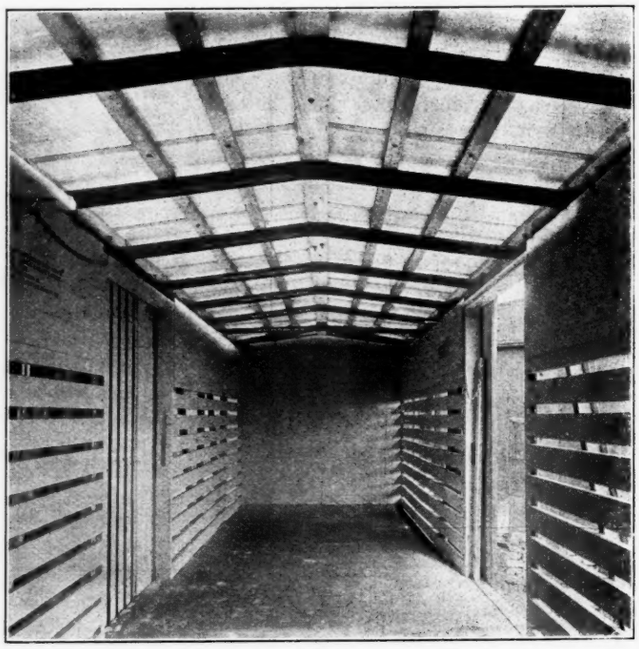
Stations.	Through.			Suburban.			Total Through and Suburban.		
	Trains.	Cars.	Pass.	Trains.	Cars.	Pass.	Trains.	Cars.	Pass.
Union	167	1097	19145	112	450	16323	279	1547	35468
Grand Central.	34	206	3175	4	13	470	38	219	3645
C. & N. W.	121	785	16811	189	845	32583	310	1630	49394
La Salle Street.	80	531	10384	111	517	24718	191	1048	35102
Dearborn	104	617	9968	42	138	8337	146	755	18305
Ill. Central	85	582	10140	288	1245	40757	373	1827	50897
Grand total	591	3818	69623	746	3208	123188	1337	7026	192811

CONVERTIBLE STOCK AND BOX CAR.

There are a number of roads where traffic conditions during certain times of the year are such that the transverse movement of empty box and stock cars amounts to a considerable item. This is well illustrated by the traffic on the Frisco lines during the calendar years 1911 and 1912. The mileage of empty stock cars out of St. Louis and Kansas City alone amounted to 4,511,710 miles each year. An equal number of empty box cars was hauled to those points from the stock-



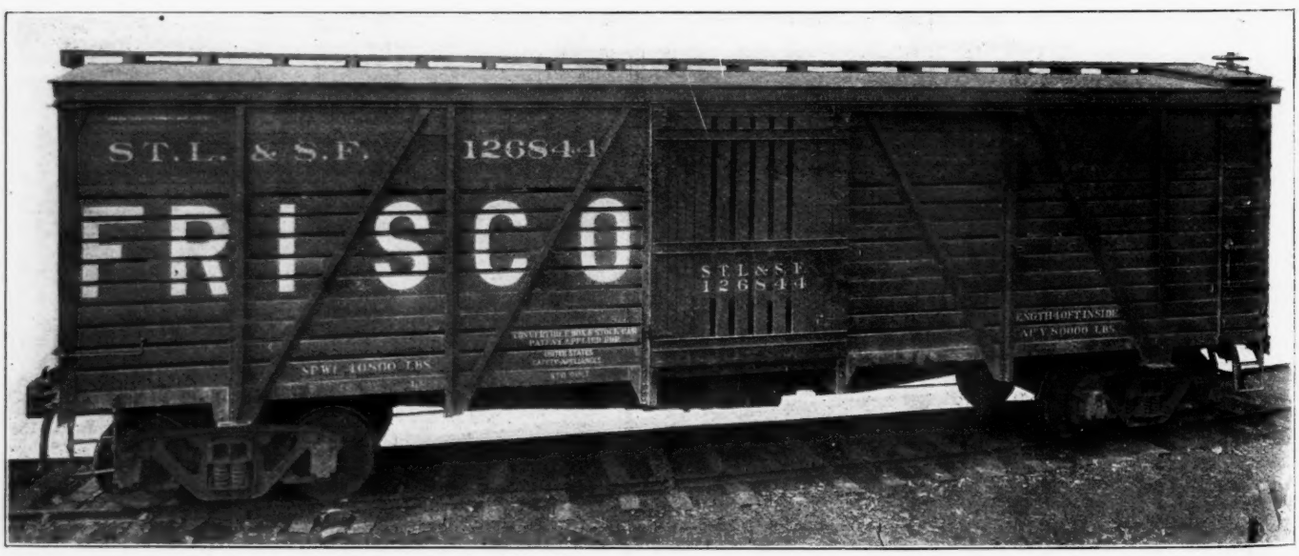
Interior of the Car When Prepared for Merchandise Shipments.



Interior of the Car When Prepared for Shipments of Stock.

loading territory for bringing back general merchandise. This made a total empty car mileage of 9,023,420 miles each year, which was moved at a cost of about $162,000. In order to obtain box cars when the shortage became acute, it had been the custom to take stock cars, thoroughly cleaning and disinfecting them, and covering the roof and entire inside surface of the cars with tar paper, at a cost of $5 to $6 per car, and loading them with certain classes of freight. During the past six years about 3,000 cars have been treated in this way with considerable success, but the car construction was such that the sides could not be made entirely proof against leakage.

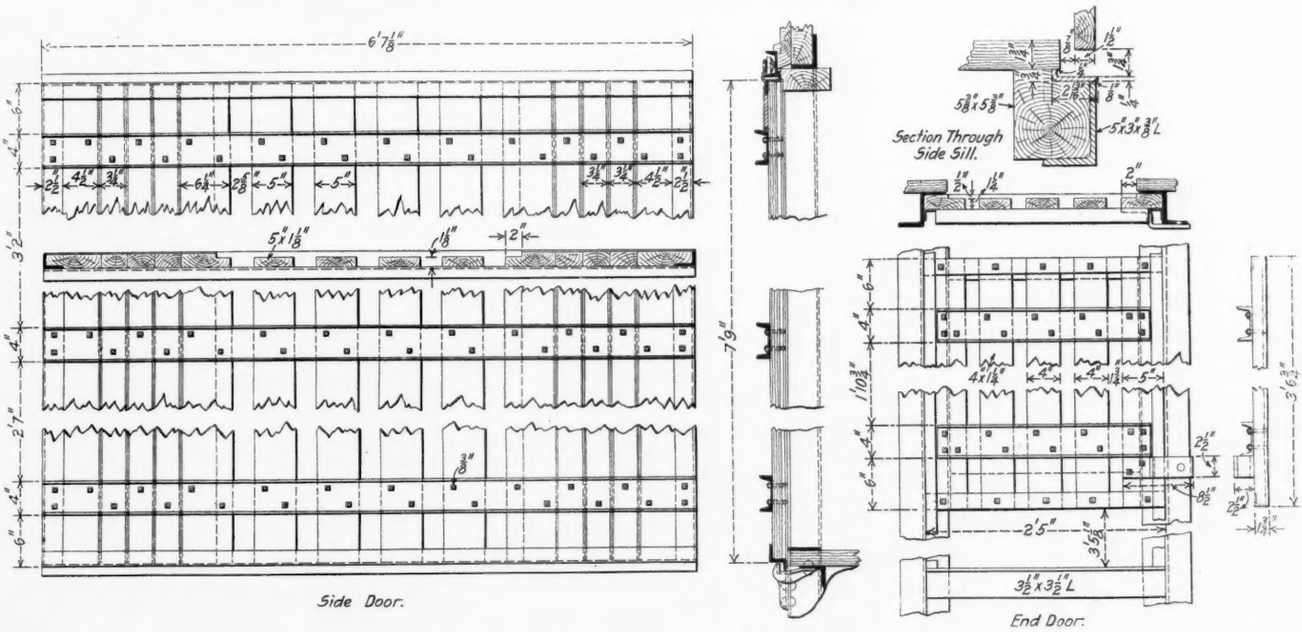
Believing that a car could be built that would readily permit of satisfactory conversion, E. D. Levy, assistant general manager of the Frisco, has been studying the question for a number of years. He has now obtained a car that seems to meet the requirements. It is built in the same manner as a box car, and with the exception of the slats, is leakproof in every respect. To convert this car to a box car it is only necessary to cover the opening between the slats with an odorless asphalt paper, as indicated in the photograph. The cost of doing this is $1.50 per car for labor and material, which with the 50 cents charged for cleaning and disinfecting, as required by the government, makes a total of $2 per car. This type of car could also be profitably used by the southwestern cotton carrying roads which in the spring months,



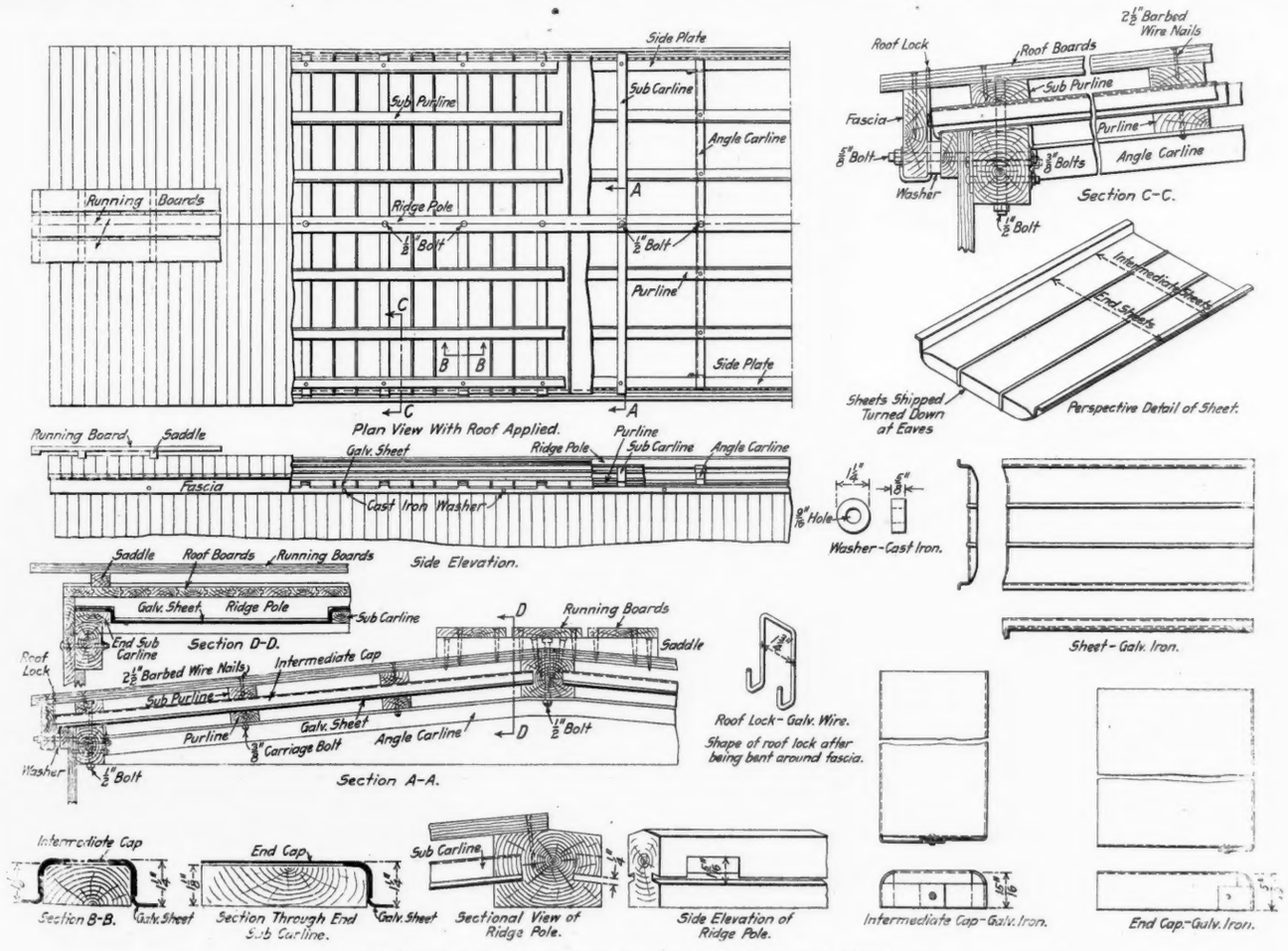
Convertible Box and Stock Car for the Frisco.

when a great deal of stock is moving from the southern ranges to the more northerly feeding grounds, are all chronically short of stock cars, and which, when the cotton crop is being moved are short of box cars, having a surplus of stock cars on hand.

While it would be practically impossible to eliminate all of this opposed hauling of empty stock and box cars, it has been estimated that 2,000 convertible box and stock cars on the Frisco would relieve at least half of it; or, in other words save $81,000 in transportation costs. The cost of cleaning and conversion of these 2,000 cars will be approximately $46,000 each year, which, deducted from the saving and trans-



Doors of the Frisco Convertible Box and Stock Car.



Roof Details of the Frisco Convertible Box and Stock Car.

portation costs of the empty car mileage, gives $35,000. By loading these 2,000 convertible cars in both directions and saving one-half of the empty car mileage, they would do the work of 3,000 box or stock, or box and stock cars, preventing the necessity of owning 1,000 cars. These 1,000 cars would represent an investment of about $1,000,000; the saving in interest charges being $60,000, in maintaining, $50,000, and depreciation, $60,000, making a net saving in the total operating costs and capital account of $205,000, or approximately $102.50 per car per year.

These convertible cars may be used for general merchandise, cotton, hay and in fact all freight moving in packages, bales, boxes, barrels or other containers, and will be a large factor in increasing the average number of loaded cars per train mile, and the gross and net tons per train mile. The car is designed for a capacity of 80,000 lbs., having the outside steel frame superstructure. The general construction is the same as that for the other box cars of this capacity that have recently been built for the Frisco and which were described in detail in the *Railway Age Gazette,* October 3, 1913, page 609. The difference in detail construction between the convertible stock and box cars and the box cars is in the roof, the siding, the flooring at the corners, and the doors. The Type B Improved Winslow roof and angle steel carlines with the X-brace at each end, as made by the Chicago-Cleveland Car Roofing Company, is used. Tests on this type of roof have shown it to be cooler by an average difference of about 4 deg. than the single or outside roof throughout the very hot weather, and this feature is of advantage in stock cars, especially when carrying hogs. The side framing is made solid down to within about 5 ft. 3 in. from the floor. The slatting is 1½ in. thick and 5½ in. wide. It is fastened to the posts and braces by ½ in. carriage bolts. The opening between the slats is 1¾ in. The end construction is the same as that for the box cars. It will be noticed in the section through the side sill that the floor of the car is ½ in. above the bottom of the lowest slat, and an opening of ⅞ in. is made between the floor and the side posts and braces. This is to permit of drainage of the car when being used as a stock car, and to also allow for the odorless asphalt paper to be extended down below the floor, when converting to a box car, so as to insure positive drainage from the sides in wet weather Two strips of paper are used on the inside of the car to cover all the openings between the slats, and are lapped so that the moisture cannot work through to the inside of the car. The paper is held in place by laths used as cleats and nailed to the slats with small nails having only sufficient penetration to hold the paper in place. The slats in the door are ½ in. thinner than the edges of the door, in order to permit the paper being applied without interfering with the action of the door.

The car was built at the company's shops, and selling rights for the convertible features have been granted the Chicago-Cleveland Car Roofing Company, the patent for which has been applied for by Mr. Levy.

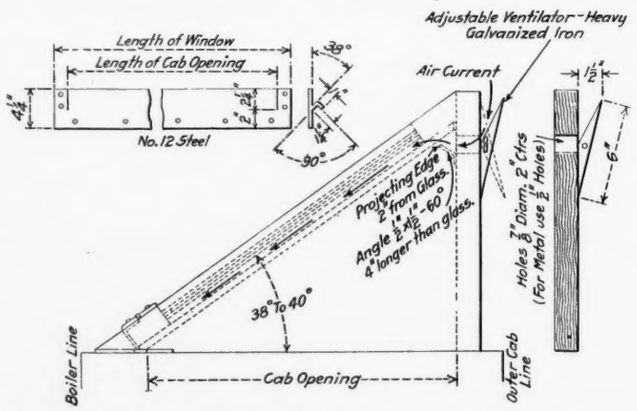
The general dimensions are as follows:

Inside length	40 ft.
Length between end sills	40 ft. 11 in.
Length over running boards	42 ft. 1 in.
Length over striking castings	42 ft. ¾ in.
Center to center of bolsters	31 ft.
Width inside	8 ft.
Height from top of floor to under side of carline	8 ft.
Height from rail to top of floor	4 ft. 1¾ in.
Height from rail to eaves	12 ft. 5⅝ in.
Width of side door opening in clear	6 ft.
Height of side door opening in clear	7 ft. 6⅝ in.
Truck wheel base	5 ft. 6 in.

Street Car Lines in Paris.—The 40 year concession granted to the General Omnibus Company of Paris on June 1, 1910, stipulated that by June 1, 1913, all the horse-car, steam, and compressed-air street car lines within the walls of Paris must be converted into electric lines, and that underground circuits only should be used on all newly relaid lines.

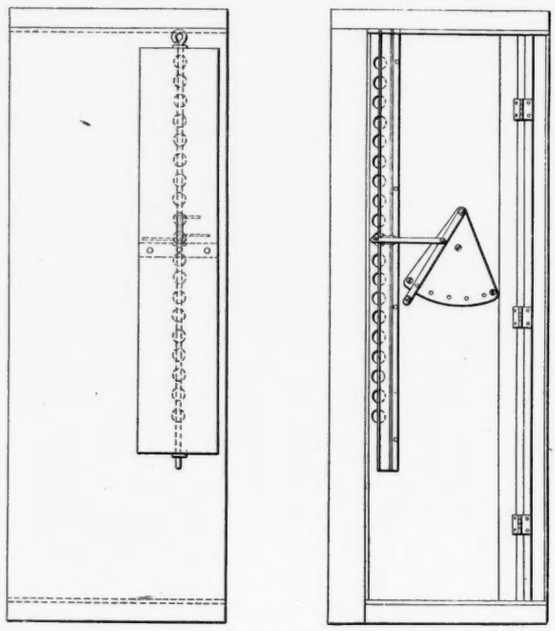
CAB WINDOW VENTILATOR.

One of the greatest annoyances to a locomotive engineman in the winter time is the collection of frost on the cab window, requiring him to keep his side window open for the observation of signals. In order to overcome this, and to provide ventilation in front of the cab when the window is closed, the window shown in the accompanying illustration has been invented by Charles M. Goodrich, Clinton, Iowa. The window is set out at an angle



Arrangement of Frost Eliminating Device on a Cab Window.

of 38 to 40 deg. from the point where the cab meets the boiler. A series of ⅞ in. holes are placed in the extended side of the cab just inside of the window, through which air is forced by an adjustable ventilator. A small vane is placed on the inside edge of these holes to further guide the air against the inside surface of the glass. By doing this the temperature of the air on both sides of the glass will be kept very nearly the same, and condensation in cold weather will be prevented. The ventilator is



Cab Window Fitted with Frost Eliminating Device.

pivoted so that the amount of air passed through these holes may be regulated. There are six positions of adjustment from the totally closed position to the maximum opening. The ventilator is operated through a series of small levers and a quadrant, as indicated in the drawing. This window does not in any way interfere with the passage of a man from the cab to the running board, and it has found extensive use on some large railways operating west of Chicago.

A. H. SMITH.

Alfred H. Smith was elected president of the New York Central & Hudson River and the Lake Shore & Michigan Southern, to take effect January 1, 1914, at a meeting of the boards of directors held in New York on Wednesday, December 10. Undoubtedly the other roads in the system will follow the same course at the earliest opportunity.

Mr. Smith was born and reared in the west and spent the first 23 years of his railway experience on the Lake Shore, leaving there in 1902 to go to New York as general superintendent on the New York Central & Hudson River. By his very thorough and extensive knowledge of both the western and the eastern parts of the New York Central system he is unusually well equipped for the work which he is about to take up. No man could have been selected who has a better knowledge of the condition and personnel of the entire system than Mr. Smith.

A. H. Smith.

From the time that he entered the service of the Lake Shore he was noted for his rugged, ready, forceful personality. Because of these characteristics everything that he set out to do he accomplished. In addition to having a great capacity for seeing and comprehending every detail, he has the faculty of deciding quickly questions which come before him. He is a big man physically, as well as mentally, and commands respect. He has always been known by those who were close to him as a good friend. Among the enginemen, trainmen and yardmen on the Lake Shore he has always been spoken of as Al Smith. He knows large numbers of the men on the road and has the faculty to a marked degree of remembering people with whom he comes in contact.

Mr. Smith received his early training under John Newell, who was president of the Lake Shore & Michigan Southern and was one of the greatest factors in upbuilding that road in the early stages of its development. Because of Mr. Smith's forceful personality, his grasp of details and outspoken manner, he was one of the very few men who were able to gain the entire confidence of Mr. Newell.

The New York Central Lines need just such a man as Mr. Smith. As the parts of the system have developed, there has come about a pressing need for improving the organization so that the various parts may be more thoroughly tied together in one strong and efficient unit. Since Mr. Smith's appointment as senior vice-president, early in the present year, he has gradually taken over some of the duties of the president and developments indicate that he has some very definite ideas as to the need for a more effective central organization. If he brings this about there is little doubt that the New York Central Lines will become a highly efficient working unit—a thing much to be desired.

Mr. Smith is about 49 years of age and his entire railroad experience has been on the New York Central Lines. He entered the service of the Lake Shore & Michigan Southern at Cleveland, in 1879, as a messenger boy. Later he was connected with the purchasing agent's office and from there went to the engineering department, and for several years worked on a change of grade and a reconstruction of the Lake Shore west of Toledo. During this time he was foreman and later general foreman of construction work. In October, 1890, he was made superintendent of the Kalamazoo division. One year later he was transferred in the same capacity to the Lansing division, and in February, 1893, was made superintendent of the Franklin division, with office at Youngstown, Ohio. From July, 1897, to April 1, 1901, he was superintendent of the Michigan division, at Toledo, after which he became assistant general superintendent, with headquarters at Cleveland. On June 17, 1901, he was made general superintendent of the road, and in February, 1902, left the Lake Shore to become general superintendent of the New York Central & Hudson River. This position he held until July 1, 1903, when he was promoted to the position of general manager. In June, 1906, he was made a vice-president of the New York Central & Hudson River, and on April 15, 1912, was made vice-president also of the other New York Central lines. In March, 1913, he became senior vice-president of the New York Central Lines in charge of operation, maintenance and construction.

A NOTABLE GERMAN STATION.—German railway administrations are famous for their stations, and amongst them the Baden State Railways deserve special mention for their recent achievements in this direction. Only a few weeks ago the administration brought into operation its new station at Basle, the largest on its system, yet on October 20 it celebrated the completion of another great work, when the new station at Karlsruhe, the capital of the Duchy, was ceremoniously opened. Within the last two years no less than seven important new stations, representing an outlay of over $30,000,000, have been opened on the Baden railway system, and the interest on this large sum amounts to $1,250,000 per annum, while the increased annual expenditure in connection with these stations amounts to no less than $1,750,000. At Karlsruhe, where the headquarters of the railway administration are situated, the question of rearranging the station has been under discussion for the past 20 years, and the cramped conditions which formerly hindered the development of the city and the work of the railway have now been surmounted by the removal of the station to another site. The new station and its accessories cover an area of nearly 246 acres, and the new works have involved the construction of 16 railway bridges and 39 subways. On the whole scheme, which includes $2,598,750 for land, $1,021,050 for bridge works, $2,285,525 for the station itself, and $395,925 for locomotive shed, repair shops, signal boxes, etc., a total of $8,895,000 has been spent.

THE FREIGHT RATE ADVANCE HEARINGS.

Roads Continue Their Case by Testimony Showing That as Gold Has Depreciated Railroad Rates Have Not Been Readjusted.

The rate advance hearings were resumed at Washington before Commissioner Harlan on Wednesday. Counsel for the Manufacturers of Cement, Lackawanna Steel Company, Eastern Paving Brick Association, Northwestern Millers' Association and various shoe manufacturers asked permission to intervene and filed protests against specific rates. The following abstract from the protest of the cement manufacturers indicates the nature of the protests.

"Complainants aver that with the exception of some slight reductions made in 1912 the general cement rate structure from the Lehigh Valley cement region to consuming points in official classification territory has been in effect since 1907 (at which time there was a general increase of about six per cent. in cement rates, except to New England) and was and is so constructed as to yield to the participating carriers very substantial and satisfactory revenues. Complainants further aver that the cement business has been extremely profitable to the participating carriers because they secure not only the remunerative rates on outbound cement above referred to, but also very remunerative rates on inbound plaster, limestone and coal. As substantial evidence of the magnitude of this traffic and of its value to the interested carriers, complainants aver that statistics kept by them show that the railroads serving complainants' manufacturing plants moved on an average for the years 1909 and 1910 the following traffic to and from the said plants:

	Tons.
Gas Coal	1,225,500
Steam Coal	837,105
Plaster	121,809
Limestone	1,015,928
Cement	4,880,000
Miscellaneous Freight	250,000
Total	8,330,342

yielding an estimated revenue to the carriers of $12,313,000.

"Complainants further aver that the plaster traffic has been very remunerative to the participating carriers and has yielded to them under the present rates which have been in effect for a long period of time very substantial and satisfactory revenues."

RELATION OF RAILWAY CHARGES TO THE SUPPLY OF MONEY AND CAPITAL.

These protests having been filed the railroads continued their case by putting on the stand Charles A. Conant, author of The Principles of Money and Banking. An abstract of Mr. Conant's testimony is given below.

The problem of changes in the purchasing power of money is an intricate one, but derives its intricacy almost as much from the necessity of care in stating terms and conclusions as from any lack of simplicity in the principles involved.

The monetary law which in the United States prescribes that 25.8 grains of gold nine-tenths fine shall be known as a dollar, does nothing to fix the value of the dollar in relation to other things. It simply establishes a sort of barometer by which the relations of other things are measured, like the yard-stick for length or the bushel for bulk. If one bushel of wheat is worth today two bushels of potatoes and the price of a bushel of wheat is $1, it is more convenient to refer the value of the bushel of potatoes to the gold dollar than it would be to speak always in comparisons of wheat and potatoes, or steel rails, or pairs of shoes. But the use of the dollar as a denominator of value in this manner by no means precludes constant changes in the value of the dollar in relation to other things. Indeed, when wheat rises from $1 to $1.50 per bushel, the value of the gold dollar in relation to wheat has fallen to 66⅔ per cent. of its former value.

This is exactly the ratio in which the purchasing power of the dollar has fallen during the last fifteen years, according to Professor Irving Fisher.

It was contended by many, when the gold dollar was increasing in purchasing power, that this was due to the increased productive power of labor and machinery—in other words, that the labor compensated by a given number of dollars produced a larger quantity of goods, of which each unit could, therefore, be sold at a lower price. That such a change has occurred is undoubtedly true, and it has tended in a marked degree to reduce the labor cost of manufactured articles within our generation. If, therefore, we encounter the fact that, in spite of this persistent increase in the productive powers of human society, the price of goods has not fallen upon the average in recent years, but that more dollars are required for the purchase of almost any given commodity than was the case sixteen years ago, ten years ago, or even four years ago, it is evidence of the depreciation of the purchasing power of the dollar.

If it requires more dollars today to purchase a given amount of goods or services, then in relation to those goods or services there has been a depreciation in the value of money. Such a decline in the purchasing power of gold, which is now the standard money in practically every civilized state, in itself constitutes a depreciation of gold. This statement is not a discussion of cause or effect—whether the increase in the supply of gold has caused a rise in prices or whether the rise in prices is due to entirely different causes. The fact remains that gold has depreciated in relation to nearly all other commodities.

It is this fact which faces the railways as well as other producers and investors, and with which they have had to deal in recent years. Those producers who have been able to operate in a market where they were free to use their own judgment and economic power in fixing prices or wages, have been able to adapt themselves more or less rapidly to the depreciation in the purchasing power of the dollar. If they were workers for wages, they have been able to demand increases in their wages to enable them to meet the increased cost of living, as expressed in dollars. If they were dealers in articles of retail trade, they have been able to advance the prices of those articles from time to time to cover the increased cost of obtaining them at wholesale or directly from the producer. By this means, they have succeeded in effecting the economic adjustment of their position to the diminished purchasing power of the dollar. The process has been gradual, although the figures which I shall soon present will show that it has been rapid. The fact that it has been gradual, and that wage-earners and merchants have been able to adapt themselves gradually to the change, has, to a certain extent, concealed its real economic significance.

What would have been said if it had been proposed by law in 1896 to require the railways to reduce their rates from 35 to 50 per cent. within 15 years? What would have been the protests and what would have been the unsettlement of the value of railway securities in the market if an order had been made by this commission to any such effect? But the silent and irresistible processes of economic forces have reduced the money value of these rates in something like this proportion within the past 16 or 17 years, while the railways have suffered a steady impairment of their earnings, and for a number of years past have been restricted by statute law from adapting themselves, like other industries, to the new monetary conditions.

To return to my essential point, it is, in substance, that the purchasing power of the dollar over the great mass of commodities has permanently fallen since the present schedule of passenger and freight rates was established. Even in a free market, unrestricted by statute law, the effect of changes in

the purchasing power of money is not simultaneously felt by all classes in the community. If such changes did act simultaneously and automatically upon all classes, then the only difference caused by such changes would be differences in the expression of wages and prices in terms of money. Unfortunately, however, for certain classes, they are not able to secure an adjustment of their wages and prices so quickly as other classes. Hence come about inequalities, by which those who are able most quickly to adjust themselves to the new conditions reap profits and advantages over those who are not able to adjust themselves so promptly.

It is obvious that those persons who had fixed incomes expressed in dollars would find it difficult, if not entirely impossible, to avoid losses from the new conditions.

It is now generally admitted that the most definite and trustworthy method of ascertaining changes in general prices is through index numbers. These index numbers are nothing, in effect, but the reduction of a great variety of prices, dealing with different commodities measured in different ways—some by pounds, some by tons, some by bulk, and some by the value of the labor which they represent—to a common denominator.

I submit below a table giving the index numbers obtained by Professor Falkner for a series of years, with the percentage by which average annual prices for 1912 exceed those of previous years. It will be observed that average prices in 1912 were 48.9 per cent. higher than in 1897; 47.8 per cent. higher than in 1896; and 18.2 per cent. higher than in 1904. Analysis of the details of prices by classes of products shows that under the head of metals and implements, the index number advanced from 86.6 per cent. in 1897 to 126.1 per cent. in 1912; lumber and building materials, from 90.4 per cent. in 1897 to 148.2 per cent. in 1912, or an increase of more than 60 per cent.

Year or Month.	Relative prices of all Commodities.	Per Cent. higher in 1912 than in each preceding year.
1890	112.9	18.3
1891	111.7	19.6
1892	106.1	25.9
1893	105.6	26.5
1894	96.1	39.0
1895	93.6	42.7
1896	90.4	47.8
1897	89.7	48.9
1898	93.4	43.0
1899	101.7	31.4
1900	110.5	20.9
1901	108.5	23.1
1902	112.9	18.3
1903	113.6	17.6
1904	113.0	18.2
1905	115.9	15.3
1906	122.5	9.1
1907	129.5	3.2
1908	122.8	8.8
1909	126.5	5.6
1910	131.6	1.5
1911	129.2	3.4
1912	133.6	...

Referring to the simple average, which takes as a standard of 100 the average wholesale price of the ten years 1890-1899, both inclusive, we obtain some interesting results. It appears that in 1880, the first year after the resumption of specie payments, prices were much higher than the average of 1890-1899. An almost uninterrupted decline occurred, however, until 1896, when the index number fell to 90.4, or more than 40 per cent. below the prices of 1880. With the resumption of business activity in 1898, the index number begins to rise until it has attained 110.5 in 1900. There was then a slight recession, followed by a slow recovery, which carried the index number for 1904 to 113. Then began the rapid upward movement of the past eight years—interrupted by the depression of 1908—which finally advanced the index number for the year 1912 to 133.6. This is an increase of nearly eleven points over the low point of 1908, and of 40.2 points over the index number of 1898.

English index numbers bear out the American in a general way, although their range of fluctuation is not quite so wide.

The total banking resources of the country per capita amounted in 1900 to $140; in 1908 to $201; and in 1912 to $235. The last-named figure is an increase of 67.68 per cent. over that of the year 1900. If this increase were due exclusively to increase in productive capacity, it would mean not only that laborers in factories had greatly increased their productive power by the aid of machinery, but that the average increase had been so great as to amount to nearly 68 per cent. when spread over the population engaged in simple manual labor and in personal services. Obviously, it requires an optimistic draft upon the imagination to assume any such phenomenal increase in the producing power of the community, and no such result is indicated by known additions to accumulated wealth.

To test the question whether the volume of goods dealt in has increased in any such ratio as banking resources, I have divided the ton mileage of the railways in 1900 and in 1912 by the population in those years and find an increase per capita of 48.14 per cent., instead of the 68 per cent. shown in banking power. A better test perhaps is afforded—so far as these figures constitute a test—by the number of tons of freight carried. Here the increase per capita is a little less than 34 per cent., or only one-half the increase in banking power.

THE PURCHASING POWER OF FREIGHT EARNINGS.

It is pertinent to this enquiry to set side by side with these changes in the purchasing power of money the changes which have taken place in the rate of compensation received by the railways for passengers and freight. Fortunately, the system of statistics established by the Interstate Commerce Commission permits an ascertainment of the average receipts per unit of service by the railways of the United States. Taking the receipts for freight alone per ton-mile and expressing them in mills, or tenths of a cent, it appears that this average of ton-mile receipts varied only within narrow limits during the whole 16 years from 1896 to 1912. In 1896, the average receipts per ton-mile were 8.06 mills; in 1912, they were 7.43 mills. This represented a decline of 63 hundredths of a mill, or about 7 per cent. This decline in freight receipts, however, was only the decline expressed in terms of money.

Quite different and striking results are obtained if one compares the purchasing power of this money in 1896 with its purchasing power in 1912. Such a comparison is easy and simple under the system of index numbers. In order to determine this ratio of purchasing power, it is only necessary to divide the rate per ton mile by the index number for prices. The result gives the relationship of the ton-mile revenue in purchasing power on different dates, expressed in mills, upon the basis of the average prices from 1890 to 1899. If the receipts per ton-mile in 1896 were 8.06 mills, and wholesale prices bore a ratio to the standard of 90.4 points, the purchasing power of the receipts per ton-mile was 8.92 mills. As the index number of prices advanced, however, even if receipts remained the same in terms of money, the purchasing power of the receipts inevitably fell in a striking ratio.

After the revival of business activity in 1897, receipts per ton-mile declined only slightly, but the index number of wholesale prices increased rapidly. The result was that the purchasing power of the money received for freight fell from a ratio to 8.06 in 1898 down to 6.61 in 1905. Then began another decline, interrupted only by the depression of 1908, which finally carried the ratio of purchasing power of freight receipts in 1912 down to 5.56. When this purchasing power of the receipts per ton-mile is compared with the corresponding figure of 1896, we find a decline of 3.36 mills, or 37.6 per cent. I conclude, therefore, simply as a question of mathematics, and without undertaking to enter into the intricacies of railway accounting or the special demands which have been made upon the railways, that the purchasing power of the moneys which are now paid for freight is approximately 37 per cent. less in the market for commodities than it was in 1896.

From 1903 to 1912 there was a decrease of 17.1 per cent. in the purchasing power of ton-mile earnings, and even from 1908 to 1912 a decline of 9.4 per cent., or nearly twice the proportion

in which it is now asked that permission be given to advance nominal rates expressed in terms of money.

The second broad subject to which I wish to address myself, in considering the present economic position of the railways, is the increased difficulty which they have found in recent years in obtaining new capital for extensions and improvements. One of the fundamental difficulties has been the unusual demand for capital from many sources during the past dozen years and the increased keenness of competition between various forms of investment.

Time was, before the era of industrial consolidations, when the bonds and shares of railways were the principal resource for the investor in finding safe and profitable use for his savings. In recent years, however, new demands have converged upon the supply of available capital in an unusual degree from the conversion of industrial enterprises into stock companies, the absorption and merger of old companies with new, the great extension of the system of local traction lines, the demands of undeveloped countries for railways and industrial equipment, and the remarkable expansion in the calls of governments upon the financial markets for the means of increasing armaments and making public improvements.

This great demand for capital which converges on the principal money markets of the world has effects similar to those produced by great demand upon other commodities—it raises its price. As the price of capital is the rental charged for its use, or the interest rate, this rate has risen in a marked degree in recent years. The influence of this condition may be summarized as follows:

1. New securities can only be sold at lower prices than formerly or must pay higher interest rates on their par value.

2. The prices of outstanding securities fall, making them unsalable in the hands of their holders except at a loss and reducing the assets and the surplus funds of savings banks, other banking institutions, and insurance companies.

3. The seekers of new capital by means of security issues must pay a larger amount in money for its use, and in view of the rise in general prices, must pay more for their materials, thus making necessary a higher rate of earnings than formerly in order to meet fixed charges.

4. Under the conditions of competition for capital thus established, industries of high earning power are able to outbid those of lower earning power for the supply of free capital in the market.

5. Incident to the decline in the purchasing power of money, there is a tendency on the part of investors to shift their investments to those paying higher returns than formerly, in order to meet the increased cost of living, even at the risk of some slight decrease in security.

6. In so far as the decline in the purchasing power of money is recognized in the financial world as a factor likely to be continuously felt, there will be a tendency on the part of investors to refrain from purchasing securities for long terms, paying a fixed income in money.

I have endeavored in this discussion to limit myself to a few simple propositions, which I think are well understood among economists and have been sufficiently proved, so far as such matters are susceptible of exact proof. We have seen that there has been an advance in prices of commodities of a broad and general character. In so far as the advance in prices has been uniform in different industries, and in so far as the increase in the wages of labor has corresponded to the advance in prices, equality of conditions under the present value of the dollar has been established. The railways, however, have not shared in this advance in the money expression of services in any such degree as other industries and wage-earners.

It is worth noting in this connection that if the commercial clients of the railways have in nearly all cases been able to obtain an increase in their receipts in money, corresponding to its diminished purchasing power, these clients have not been called upon to disburse in freight rates the ratable proportion of their increased charges to the consumer, and have from the enforced rigidity of such rates in terms of money transferred an unearned increment to their own coffers at the expense of the railways. The railways have not adapted their charges, as have other industries, to the change in the purchasing power of money. They have continued to sell their services for an amount which has remained comparatively fixed in money, but has declined greatly in purchasing power. Such additional capital as they have sought by the issue and sale of securities has been obtained on higher terms than in former years, while its purchasing power, in materials and wages, has been much less than in former years. The railways have been in the peculiar position of seeing prices rising all around them, while they have been unable to make advances proportionate to their changed relations to other industries.

If the value of the money received by the railways for their services has so seriously declined in purchasing power as to deprive them of the means of meeting their legitimate charges and obtaining new capital at its present rental price, they are not on an equality with other industries; they are receiving a much less proportionate share of the proceeds of the economic output of the country than that which they formerly received; and they are less capable of contributing their share to equipping this country for unfettered competition with other countries in the field of production and international commerce.

WAGE MOVEMENTS.

On Wednesday afternoon J. G. Walber, assistant to the third vice-president of the Baltimore & Ohio, testified as to wage increase. His statement is given below substantially in full.

Estimates for 29 of the 38 railroad systems, parties to this rate proceeding, show an increase in wages for 1913 over 1910 of $48,618,972.41, due to changes in rates of pay and working conditions.

This figure was obtained as a result of a request to the railroads to take the actual performance for the year ending June 30, 1913, and compare the rates of pay and working conditions prevailing in that period with those in effect in October, 1909, a period prior to the date of any of the important increases subsequently made.

In addition to the increases up to June 30, 1913, careful estimates show that the increases in wages recently granted to the firemen, conductors and trainmen will add not less than $8,750,000 more to the expenses of the railroads parties to the respective arbitration proceedings, this estimate being based on the volume of business for the calendar year 1912.

The 1910 wage movements were begun by the conductors and trainmen, who had formed an association known as the Eastern Association of General Committees of the Order of Railway Conductors and Brotherhood of Railroad Trainmen.

Late in December, 1909, the management of the eastern railroads was presented with a proposition from these employees for the adoption of revised rates of pay and certain rules governing working conditions, with the request that answers be given on January 20, 1910. At the same time the presidents of the two organizations communicated with the management of the railroads for the purpose of ascertaining whether they would prefer to conduct the negotiations collectively for all the railroads or individually. The managements decided to negotiate individually.

Thereupon the Baltimore & Ohio was selected for opening the negotiations, the reason for such selection being, as stated by the representatives of the employees, that the bases of the Baltimore & Ohio schedules more nearly corresponded with the revised proposition than the schedules of practically every other eastern railroad, also that it meant less of an increase for the Baltimore & Ohio to adopt the proposed rates than any other railroad, with perhaps one exception. It early became apparent that the authority to make settlement rested entirely with the

representatives of the organizations, and that the employees of the individual companies were powerless to make settlements as in the past.

The management of the Baltimore & Ohio Railroad was unable to agree with the representatives of the organizations; thereupon they appealed to the individual employees who authorized them to declare a strike in the event satisfactory terms were not agreed upon.

After such proceeding was concluded, negotiations were resumed, and it being found impossible to reach a settlement the services of the federal mediators, under the Erdman Act, which was then in effect, were requested by the president of the Baltimore & Ohio Railroad Company, the representatives of the employees declining to join in the request. At the request of the mediators the representatives of the employees agreed to conduct negotiations through them, and after negotiations, lasting a week or more, terms of settlement were reached upon a basis which was practically a split between the then existing rates and those requested.

This settlement, it was carefully calculated at the time, increased the rates of pay 5.44 per cent. Effective September 1, 1910, due to the New York Central arbitration award, as explained hereafter, it was necessary to increase by 20 cents per day the yard rates which had been agreed upon in the Baltimore & Ohio settlement. It was also necessary to apply the basis of the Baltimore & Ohio settlement to the Baltimore & Ohio Southwestern. The effect of the adjustment in the yard rates and the adjustment of the Baltimore & Ohio Southwestern schedules was to increase the percentage to 9.05 for the conductors and trainmen for the Baltimore & Ohio system.

While the mediation proceedings were pending on the Baltimore & Ohio, negotiations were opened by the two organizations on the Boston & Maine and the New York, New Haven & Hartford, on which roads settlements were reached on practically the same basis as had been adopted on the Baltimore & Ohio Railroad.

Negotiations were also begun by the presidents of the two organizations on the New York Central. The New York Central was unwilling to adopt the rates agreed upon in the Baltimore & Ohio settlement. The representatives of the organizations took the position that, having agreed to these rates on the Baltimore & Ohio through federal mediation, they could not reasonably agree to any other rates on any other railroad, having declared themselves to both the Baltimore & Ohio officers and the federal mediators that whatever rates were agreed upon for the Baltimore & Ohio would be established upon the eastern railroads so far as the means at their command would accomplish this. However, after prolonged negotiations with the New York Central they finally agreed to an arbitration of their request as applying to that company.

The representatives of the employees in the recent arbitration proceedings, affecting conductors and trainmen, made a statement that approximately 17 railroad companies had agreed to be bound by the New York Central award, and as soon as the award was announced such railroads adopted the same.

Negotiations were also opened on all other railroads with the result that by practically July, 1910, the schedules of practically all the eastern lines for conductors and trainmen had been revised on the basis of the New York Central award with varying dates upon which they were to become effective, some of the effective dates being extended into the year 1911.

It was estimated that the settlement on the New York Central cost 17.4 per cent.; on the Cleveland, Cincinnati, Chicago & St. Louis Railway 12.7 per cent.; on the Lake Shore & Michigan Southern 11.92 per cent.; on the Michigan Central 19.8 per cent.; on the Boston & Maine 19.6 per cent., and the New York, New Haven & Hartford 15 per cent.

Effective April 1, 1910, the Pennsylvania system granted to all their employees, including conductors and trainmen, a flat increase of 6 per cent., with the exception of yardmen, who received an increase of 8.4 per cent., the percentage for both road and yardmen equaling 7 per cent.

While the Baltimore & Ohio schedules have for years been on the basis of mileage, that, 100 miles or less, 10 hours or less, constituting a day, with some relatively unimportant exceptions, the Pennsylvania Railroad had had two bases of pay for enginemen and trainmen, commonly known as a high rate day applying to runs of over 100 miles with overtime after twelve hours, and a low rate day applying to runs of less than 100 miles with overtime after eleven hours. These rates were not uniformly applied, but their application varied according to the class of service, that is, whether through or local, and according to the conditions on the several divisions. The adjustment of 6 per cent. placed their runs on practically the same basis as the rates granted in both the Baltimore & Ohio settlement and the New York Central award, but on account of the overtime limits which they previously employed the employees considered they would not fare so well compared with other neighboring lines as they had formerly; also the yard rates awarded in the New York Central arbitration were higher than the rates the Pennsylvania lines were paying, including the 6 per cent. increase. The employees declined to accept this settlement, and on July 14 negotiations were broken off, the men notifying the company that they would leave the service within forty-eight hours. Several days later it being apparent that there was a lack of understanding, conferences were resumed and further adjustments made effective from June 1, 1910, through which additional increases amounting to 4.4 per cent. in road service and 6.9 per cent. in yard service were granted. These coupled with the previous adjustments produced increases of 12.35 per cent. for the conductors and trainmen on the Pennsylvania lines east. The settlement made on the Pennsylvania lines west, at approximately the same time, resulted in an increase of 12.37 per cent.

While there has been no definite relation between the rates of pay of engineers, firemen, conductors and trainmen, for a great many years as one class of employees has been increased the other classes were correspondingly increased. The managements of the eastern lines received requests from their engineers and firemen for adjustments of their rates of pay and working conditions while the negotiations were pending with the conductors and trainmen, and settlements were made by these companies with the representatives of their employees very largely in line with the increases granted the conductors and trainmen.

On the Baltimore & Ohio Railroad, effective April 1, 1910, the engineers received increases amounting to 8.03 per cent.; firemen, 9.04 per cent.

Pennsylvania Lines East—Engineers, effective June 1, 12 per cent.; firemen, effective April 1 and June 1, 9.6 per cent.

New York Central & Hudson River—Engineers, effective May 1, 8.93 per cent.; firemen, effective May 1, 9.8 per cent.

Lake Shore & Michigan Southern—Engineers, effective June 1, 8.6 per cent.; firemen, effective May 1, 7 per cent.

Michigan Central—Engineers, effective September 1, 16.4 per cent.; firemen, effective May 1, 16.93 per cent.

Cleveland, Cincinnati, Chicago & St. Louis—Engineers, effective April 1, 11 per cent.; firemen, effective June 1, 5.3 per cent.

At this time, the railroads generally also increased other classes of employees to greater or less extent. For illustration:

On the Baltimore & Ohio all employees receiving less than $212 per month were increased 6 per cent., effective April 1, 1910.

On the Pennsylvania System all employees receiving less than $300 per month received an increase of 6 per cent., effective April 1, 1910.

On the New York Central and Boston & Albany all employees receiving less than $200 per month received an increase of 7 per cent., excepting employees whose wages had been increased January 1, 1910.

With the exceptions of increases granted to certain occupations and in some cases certain classes of service, the rates established in 1910 continued until the engineers arbitration in the year 1912. In January of that year the eastern railroads were presented by the committees representing their engineers

with a request for revision of their wage schedules. The railroads decided to handle the movement collectively; conferences were held and the requests of the engineers were declined. They appealed this decision to the individual engineers who authorized their representatives to call a strike in the event of satisfactory settlement not being reached. After the so-called strike vote was tabulated, conferences were resumed but the railroads refused to recede from their position. Both parties refused to request mediation under the federal law, but the federal mediators intervened of their own volition. Their intervention resulted in arranging for arbitration, by a special board consisting of the Honorable Oscar Straus, chairman; Doctor Charles R. Van Hise, Honorable Frederick Newton Judson, Otto N. Eidlitz, Albert Shaw and Daniel Willard representing the railroad companies, and P. H. Morrissey, representing the employees. Hearings were held from July 15 to 27 inclusive, and the board rendered its decision as of November 2, 1912, effective from May 1, 1912. The railroad parties to this arbitration estimated that the wages of engineers were increased approximately $1,600,000 or four per cent. The award having been rendered in November, 1912, none of the cost appears in the expenses for the fiscal year ending June 30, 1912, the increase for May and June being taken up in the expenses for the fiscal year ending June 30, 1913. These rates are still in effect for the engineers.

The application of this award to the Baltimore & Ohio cost $193,925 or 5.16 per cent.

The agreement to arbitrate the engineers questions was executed in New York City on April 30, 1912. On April 29 the president of the brotherhood of locomotive firemen and enginemen communicated with the chairman of the conference committee of managers, enclosing a proposition for revision of their schedules and asking whether it would be agreeable to handle the negotiations collectively or individually. The railroad companies decided to handle it collectively. Owing to the pending hearings in the engineers arbitration proceedings negotiations with the firemen had to be deferred. Meetings were held in July and August but they were only of a preliminary nature. Final conferences began on December 3, 1912, and with several intermissions continued until January 16, when, owing to the inability to agree, the firemen adjourned and presented the situation to the employees on each railroad and were authorized to call a strike in the event of satisfactory settlement not being reached. On February 11 conferences were resumed but it still being impossible for the railroads and firemen to agree, both parties joined in request to the federal mediators to intervene. This intervention resulted in arranging for arbitration under the terms of the Erdman Act, the arbitrators selected being the Honorable William L. Chambers, chairman; W. W. Atterbury representing the railroad companies and Albert Phillips representing the employees. The arbitration proceedings began in New York on March 10, terminating on April 5. The decision was rendered April 23, effective from May 3, 1913. Owing to numerous questions arising under this award it has not been applied in its entirety on all railroads, but the conference committee of managers have made a careful estimate of the cost thereof, which is $2,757,000 per annum or 9.4 per cent., based on operations for the calendar year of 1912. The Baltimore & Ohio has applied the award and careful calculations show the increased cost per annum to be $295,500 or 10.57 per cent.

While the negotiations with the firemen were in progress, a communication dated December 28, 1912, was addressed to the chairman of the conference committee of managers by the presidents of the Order of Railway Conductors and Brotherhood of Railroad Trainmen, advising that on January 6, 1913, certain wage propositions would be presented by the committees of the two organizations to the representatives of the eastern railroads east of Chicago and north of the Chesapeake & Ohio, and inquiring whether it would be agreeable to the railroads to handle the negotiations collectively or individually. On various dates in the early part of January, 1913, each of the railroads involved received these requests from their respective committees. The railroad companies decided to handle the negotiations collectively.

On account of the pending arbitration proceedings with the firemen it was impossible to hold conferences until April 22. It developed that it was impossible to reach a settlement, and the representatives of the conductors and trainmen returned to their respective railroads, presenting the situation to the employees and obtained authority to declare a strike in the event of their inability to negotiate satisfactory settlement. Conferences were resumed on July 8, continuing with several intermissions, until July 16, when it was concluded that a settlement could not be reached. A request signed jointly by the chairman of the conference committee of managers and the presidents of the two organizations was whereupon addressed to the President of the United States for the services of the board of mediators and conciliation, as provided in the Newlands Act which had recently been passed, superseding the Erdman Act. Through this intervention an agreement to arbitrate the differences was entered into on July 26, the board selected consisted of the Honorable Seth Low, chairman, Doctor John H. Finley, Messrs. W. W. Atterbury and A. H. Smith, representing the railroad companies, and Messrs. L. E. Sheppard and D. L. Cease representing the employees. The hearings began on September 11 and terminated October 10. The award was rendered November 10, effective from October 1, 1913. Up to this time the award has not been applied, but the arbitrators state in their award that the cost is estimated at $6,000,000 per annum or 7 per cent. While the management of the Baltimore & Ohio and the representatives of the employees have not, up to this time, had conference for the purpose of revising the schedules to conform to the award, careful estimates have been made of the cost thereof, which indicate that the wages of conductors and trainmen on the railroad will be increased $578,112 per annum, or 7.55 per cent.

It will be seen from the foregoing that, since and in addition to the wage increases granted in the calendar year 1910, a small portion of which was effective in the fiscal year ending June 30, 1910, the engineers, firemen, conductors and trainmen have been awarded increases through arbitration proceedings amounting to $10,350,000 per annum on the eastern railroads, and increases in rates of pay have been granted to various other classes of labor amounting to large sums in the aggregate in addition to those granted in the year 1910.

FREIGHT CARS IN SWEDEN.—The freight cars of Sweden are of a type similar to those generally used in England and on the continent. Swivel trucks for use on freight cars, however, are unknown in Sweden. Only the light, 4-wheel cars which can be switched in yards by men without car movers, are in use in that country.

ARGENTINE COURTS PROTECT RAILWAY CLERK.—That Argentine courts of law intend to maintain and protect the rights of railway property and the life of the employes is exemplified by the recent case where Lieutenant Badie, of the Argentine army, shot Sr. R. Haedo, a ticket agent at Retiro station of the Central Argentine Railway. It appears that in spite of the crowd before the ticket office the lieutenant forced his way to the front and demanded priority of being served, and on Haedo, the ticket agent, refusing to acquiesce, Badie drew his revolver and fatally wounded the man. Badie's defence was on the ground that Haedo's refusal was a direct insult to the Argentine flag. The public prosecutor, however, said the case was without precedent, and he did not see what the flag of the army had to do with the moral duty of an inoffensive clerk; he passed a sentence of three years' imprisonment. Badie appealed to the higher courts, with the result that the sentence has been increased from 3 to 10 years, coupled with an expression of regret that capital punishment was not permissible in the republic.

General News.

The repair shops of Street's Western Stable Car Line in Chicago were partially destroyed by fire on December 4, with 25 cars.

President Wilson says that he intends to reappoint Interstate Commerce Commissioner Clements, whose term expires at the end of this month.

The United States district attorney at Chicago last week filed 25 suits against six railways, charging violations of the laws regarding the transportation of livestock.

The shops of the Missouri Pacific at Sedalia, Mo., and Little Rock, Ark., and the shops of the Missouri, Kansas & Texas at Sedalia and Parsons have been placed on a 7-hour basis for the winter.

The Chicago, Burlington & Quincy has put in service five new all-steel dining cars built by the Pullman company. These cars are 79 ft. 6 in. long and seat 36 persons. They are lighted by indirect lighting.

Pierce Butler, of St. Paul, Minn., has been selected as a member of the board of arbitration which has been hearing the wage controversy between the Chicago, Burlington & Quincy and its trainmen, to succeed Fairfax Harrison, who resigned on account of his election as president of the Southern.

In New York City, December 13, the Interstate Commerce Commission, represented by Commissioner Prouty, will begin a hearing in its investigation of the complaint of the Postal Telegraph Company that it does not receive fair treatment from the Western Union where messages are interchanged.

The Independent Order of Railroad Employees is the name of an organization which, according to a Reading (Pa.) paper, has been in existence on the Philadelphia & Reading Railway for a year past, and has been the means of getting the wages of employees—principally or wholly telegraphers—raised in an aggregate amount of $60,000.

The Pennsylvania Railroad, like other roads, has recently reported largely diminished net earnings, and the shops of the company have been put on short time; but, coincident with this announcement, comes the news that the movement of freight over the main line is so heavy that 300 cars a day are diverted at Altoona and sent eastward over the Petersburg cutoff.

An unusually severe snow storm passed over Colorado last week and for several days seriously interfered with traffic of all kinds. In Denver the snowfall was 44 inches. Street cars were abandoned in the drifts and many of the streets were impassable for vehicles of all kinds. Trains from all directions were many hours late and some lines were blocked for days. The storm ceased on Friday.

The House Committee on Interstate and Foreign Commerce held a hearing at Washington last Saturday on bills designed to promote safety on railroads. Mr. Belnap, inspector of the Interstate Commerce Commission, spoke in favor of regulations to limit speeds of trains. Mr. Borland, assistant chief inspector of safety appliances, spoke in favor of the Esch bill, making the block system compulsory.

J. B. Warrington, supervising agent of freight service of the Philadelphia & Reading, testifying at a hearing before the Interstate Commerce Commission in Philadelphia last week, said that his road had plans for making improvements in freight stations in that city, to cost $1,527,974. Improvements at Front and Chestnut streets will cost $538,974; at Broad and Callowhill streets, $268,000; at Willow and Noble streets, a double deck freight house, $500,000.

C. A. Cook, an usher on the westbound platform of the passenger station of the Pennsylvania Railroad at North Philadelphia, is so efficient and courteous in the discharge of his duties that a passenger who had observed the usher's conduct for two or three years, wrote to the general manager of the road a letter of appreciation and commendation; and the railroad company not only prints the letter, in a pamphlet to be circulated in newspaper offices and elsewhere, but gives with the letter a portrait of Mr. Cook.

The Cleveland, Cincinnati, Chicago & St. Louis announces that the divisional organization which has heretofore prevailed is discontinued and a departmental organization is substituted. The superintendents are relieved from the duty of supervision of engineering department matters on their respective divisions. In the engineering department, the chief engineer will have charge of all construction and standards of all matters in connection with contractual relations with individuals and corporations and all work heretofore handled by the engineering department except maintenance of way and structures. A chief engineer of maintenance of way will have charge of all matters pertaining to maintenance only, reporting direct to the general manager. Engineers of maintenance of way will report to and receive instructions from the chief engineer of maintenance of way on all matters pertaining to maintenance and to the chief engineer on all other matters pertaining to the engineering department.

The American Institute of Consulting Engineers, Alfred Noble, president, has sent to President Wilson a letter requesting that an able and experienced engineer be appointed to one of the vacancies on the Interstate Commerce Commission. The letter points out the special fitness of an engineer to deal with questions coming before the Commission concerning engineering and railroad operation. The railroad engineer's experience is useful also in dealing with the regulation of rates. The Institute has no candidate and declares that it has no motive except to serve the administration. The President is reminded that an engineer of the type under consideration would not serve in a subordinate capacity, under laymen, while yet he would probably make personal sacrifice for the honor of serving on the commission. The Institute asks not only the appointment of an engineer, but of an engineer with judicial temperament, executive ability, and the other obviously necessary qualifications for such a high office.

Railway traffic in Texas has been seriously affected during the past week by floods in the Brazos and Trinity rivers and high water in many other streams, causing considerable damage to tracks and bridges. On December 3, the Missouri, Kansas & Texas was forced to suspend traffic between Hillsboro and Georgetown, Tex.; the Texas & Pacific had several washouts between Arlington and Handley; the Houston & Texas Central was tied up for a time by a washout 100 miles south of Dallas; the Missouri, Kansas & Texas bridge at Waco was washed out; two miles of the International & Great Northern track was washed out at Maypearl, near Fort Worth, and a long pile trestle near Hearne was swept away. Trains on nearly all roads in the state have been obliged to detour, and service has been very irregular for several days. The floods have extended also to Eastern Oklahoma and Western Arkansas, and swollen streams have done considerable damage in parts of Missouri and Kansas. A St. Louis & San Francisco bridge at Talihina, Ark., was washed away on December 4, and a large part of the false work of the steel bridge being constructed between Forth Smith and Van Buren, Ark., was destroyed by a flood in the Arkansas river on December 5.

Coroner's Jury Report on Panama Railroad Accident.

The coroner's jury empaneled to investigate the collision on the Panama railroad on November 6 between a passenger train and a work train, which resulted in the death of six persons, has submitted a report placing the responsibility for the collision on the crew of the work train, who are said to have encroached on the right of the passenger train because they "for the moment overlooked its presence, position and movements." The jury recommended that the block system be maintained for the full 24-hour day and that no crews be allowed to work longer at one time than the regular established hours of service, except in cases of emergency.

Fire Prevention Day on the Rock Island.

Paul Hevener, Assistant Supervisor of the Insurance fund of the Rock Island lines, has announced the results obtained by the observance of Fire Prevention Day. The following circular was sent to all superintendents: "October 9 has again been set aside by the governors of the various states, and the National Fire Protection Association, as Fire Prevention Day. The real purpose of this day is to make a fall cleanup of premises before the setting in of winter. It has been said by eminent authority

that cleanliness is 90 per cent. of fire prevention, and I trust you will circularize this matter among your agents, master mechanics and other subordinate officers, and see if we, on the Rock Island cannot make it a day of general housecleaning."

A report in detail has since been received from all divisions which includes the following as some of the accomplishments of the day's work: Interior of all buildings given a thorough housecleaning; rubbish, grass and all other inflammable material removed from under and around buildings; fire apparatus, hydrants, hose, couplings, etc., carefully examined to insure efficient service in case of emergency; provision made for oil storage and lamp cleaning outside of main buildings, and fresh sand provided; stove pipes and flues inspected and defects remedied; birds' nests removed from eaves of buildings to prevent engine-spark fires; accumulations of old straw, hay, etc., removed from stockyards; metal boxes provided for storage of matches and fusees; "no smoking" signs posted; bunk cars thoroughly cleaned out; open spaces under platforms and buildings boarded up.

Form 19 Exclusively.*

At a casual glance, it would seem that there is a real element of safety in the conductor's signature on a train order and his personal delivery of the order to the engineman; but when the process of transmission and delivery is analyzed, it will be found that the essential factors are (1) correct transmission and repetition, (2) proper display of the train order signal, (3) assurance of delivery.

The first and second factors are alike in all respects up to the delivery of either "31" or "19" orders. Errors of transmission and repetition or failure in display of signal are as likely in one as in the other, and no more likely in one than in the other. It is evident, therefore, that the crux of the whole matter is in assurance of delivery. That this assurance is greater in the delivery of "19" orders is beyond question. In delivering "31" orders the operator simply sees that the signal is displayed and beyond an occasional glance, especially by night, to observe whether it remains displayed, has no further responsibility in the matter until the train stops and the conductor reports for the orders that may be awaiting him or the clearance card which permits him to disregard the signal. The conductor's signature on the order and its transmission to the dispatcher before "complete" can be given are mere formalities. This procedure, to be sure, certifies to the despatcher that the conductor has received the order, but is no assurance at all until the train has been stopped and evidences nothing more than that the signal has been displayed and seen and its indication obeyed. There remains just as much chance of misunderstanding of the order, forgetfulness of it or misreading of it as before, for the order has undoubtedly been repeated to the despatcher long before. The standard code does not require the conductor to read the order to the operator or the engineman to read it to the conductor. Apparently that is not considered an essential element of safety, although most roads so regard it. Is it, in reality? More than one case of careless reading by enginemen and consequent disaster has been occasioned by perfunctory reading by conductors and dependence by the engineman on the evidence of his ears instead of also his eyes.

In the delivery of "19" orders all this is changed and, in our opinion, greatly in the interest of safety. The operator becomes an active instead of a passive agent in the transaction. On him now rests the responsibility of actual delivery. He is on the qui vive for the approach of the train for which he holds orders. He is out on the platform to deliver them to it. If the train order signal is not properly displayed, he notices it and uses hand signals. The chance that the train will run past the station without the orders is much less, and if either engineman or conductor fails to catch them the train must stop, back up if necessary, and obtain them before proceeding. Once obtained, each must read for himself. This done, the orders will be as certainly obeyed as if they had been delivered under the "31" procedure. Furthermore, to insure that they—all of them, if any—will be delivered, the operator must, before arrival of the train, repeat from the clearance card which invariably accompanies orders, or should accompany them, their several numbers to the despatcher, who checks these numbers with his office record and whose O. K. is necessary to make the clearance card valid. In our opinion, assurance of delivery of train orders is the chief thing to be sought for. Upon that depends safety in train despatching more than upon any other factor. The "19" order, we believe, assures delivery more certainly than the "31." It does not lessen the work or the responsibility of the train despatcher, and train despatchers advocate it not for that reason, but because their experience has led them to believe that it is superior to the "31" in safety and immensely more effective in moving traffic.

*Editorial from the *Train Dispatchers' Bulletin.*

Grashof Medal Presented to George Westinghouse.

The ceremony of presenting the Grashof medal to George Westinghouse took place at the annual convention of the American Society of Mechanical Engineers on Wednesday evening, December 3. Unfortunately Mr. Westinghouse was unable to be present, and Dr. Goss, the president of the society, turned the medal over to Mr. Hartness, the president-elect, to be delivered to Mr. Westinghouse. The Verein Deutscher Ingenieure was represented by Geheimrath Romberg, G. D. Waetzoldt, Rudolph Herring, Henry Hess and Col. E. D. Meiers.

Mr. Westinghouse is the first American to receive this medal. It was founded by the Verein Deutscher Ingenieure of Germany in memory of Franz Grashof and is given by the Union only on recommendation of the council, and by unanimous vote in open general meeting, to men who have rendered pre-eminent service in the field of engineering, either in research or in practical activity. It is the highest honor in the gift of the engineering profession of Germany. The actual award of the medal to Mr. Westinghouse was made at the fifty-fourth annual meeting of the Verein Deutscher Ingenieure in Leipzig, Germany, June 23, 1913, officers and members of the American Society of Mechanical Engineers being present. In making the presentation Dr. Oskar von Miller, president of the Union, said:

"The distinction conferred by the largest scientific and technical society in the world is not a thing that is given away on a festive occasion, nor one to serve as a mark of attention and courtesy; it can be won only by actual services for the good of humanity. Engineers will have no doubt that George Westinghouse, whose name is so well known throughout the world, does deserve this distinction."

Chicago Terminal Discussion.

Negotiations regarding the conditions to be included in ordinances providing for the construction of a Union station in Chicago for the Pennsylvania Lines, the Chicago, Burlington & Quincy, and the Chicago, Milwaukee & St. Paul, have been in progress through the past week before a sub-committee of the city council committee on railway terminals, Engineers J. F. Wallace and Bion J. Arnold, and representatives of the Chicago plan commission, and the citizens' terminal committee. The Union Station Company has been represented by Attorney Robert Redfield. The engineers have been gradually reconciling various divergent views expressed in their original reports, and the negotiations are now in a stage of making concessions for the purpose of reaching a common ground for the railways in the city. On December 5, following a meeting of the executive officers of the roads, Attorney Redfield presented a list of concessions which the roads will agree to make, including co-operation with the city in the construction of several viaducts and other street improvements, and co-operation with the city in the establishment of a permanent expert commission on terminals, if provided for by a separate ordinance; and payment of full compensation to the city for all streets vacated. The Burlington also promised to co-operate with the city in the straightening of the Chicago river. It was brought out that the Chicago & Alton, which uses the present Union station, is not a party to the plan for a new station. An effort was made to secure an agreement by the roads to abandon the station at Jackson boulevard when its capacity is outgrown, and to move south to Twelfth street, but Attorney Redfield has asserted that the roads will not make such an agreement.

Texas Public Sentiment More Friendly.

J. H. Hill, president of the General Managers' Association of Texas, in his annual report to the association, presented at a meeting at Dallas on December 5, discussed the public relations of the railways in Texas as follows:

"To my mind the greatest asset the association has to its

credit is the success which has followed its endeavors to bring about a better understanding and a more friendly feeling between the railroads and the people.

"It has in a dignified and businesslike manner, by personal efforts of its members and through the medium of the press (the latter misunderstood at first by a few, but now understood by nearly all), sought to place before the public such statements and facts as would enable the people to fully understand the true relation between them and the railroads.

"This policy has been followed for two reasons. The first and main one is that the people pay all the expenses, damages, taxes, etc., pertaining to the operation of the railroads, and are therefore entitled, as a matter of right, to know why these expenses are and how they affect them, in order that they, the people, may, in the exercise of their just and legal rights, have an opportunity to oppose the creation of additional and unnecessary expenses which the public would have to pay. Second, because a very small and insignificant percentage of the people of this country have, in the past, for their own personal gain and advancement sought to engender feelings of prejudice and ill-will toward the railroads by resorting to abuse and misrepresentation. Such misrepresentations, though in many instances ridiculous, when not denied or refuted, have been accepted by many honest and fair-minded people as true.

"This policy of taking the public into our confidence and treating it as it deserves to be treated has occasioned some expense; but for every dollar so expended, hundreds of dollars have been saved in expenses which would have been saddled upon the people but for such efforts. The people, therefore, have been benefited.

"Hundreds of letters received and the expressions in the editorials of a fearless press are convincing that our present practice of dealing openly and fairly with the people meets with their hearty approval. In fact, but two adverse criticisms appeared in the press throughout the entire state, both of which were promptly and effectively answered. It can be truthfully said that the great and overwhelming majority of the people of Texas desire to be fair to the railroads, and will be if honestly informed.

"At the present time it is the policy of the association to continue to give public expression, when considered necessary, to any and all questions upon which the joint welfare of the people and the railroads depend, inviting honest inquiry and criticism, and at no time to base statements upon statistical figures that cannot be proven by the public records of the railroad commission and other public offices of the state.

"That the sentiment of the people of the state toward the railroads has changed decidedly for the better, due in no small degree to the fair and honest expressions of the press and the information given to the people through the channels of publicity referred to above, is patent to all, and a continuance of such policy is, to my mind, not only proper but desired by the public.

"No agreement has been entered into nor action taken upon any subject by the association since its organization that is in conflict with the organic or statutory laws of the state."

Mr. Acworth's Observations in America.

W. M. Acworth, the English railroad economist, who has just gone home after a two months' stay in this country, spoke to a reporter of the *New York Times* concerning business conditions here; and his words are reported in substance as follows: Refusal of the freight rate increase which the eastern railroads are now asking would cause much concern to European holders of American securities. The railroads have made out a very strong case in favor of the proposed 5 per cent. increase. The Interstate Commerce Commission seems more desirous of being entirely fair, although it is perhaps handicapped by popular opposition to allowing the railroads a higher level of rates.

It seemed to Mr. Acworth that the commission had gone somewhat beyond the lines imposed upon it by Congress. It is not incumbent on the commission to suspend proposed increases in rates practically as a matter of course; it should only resort to this power when some special reason appears for believing a proposed change in rates to be unreasonable. In actual practice, he thought, a proposed increase in rates by the railroads had become little else than an application by the railroads to the commission for permission to change their tariffs. He did not believe that the law was intended to work just in that manner.

Mr. Acworth gave praise to the manner in which American railroads as a whole were being managed, and expressed surprise that railroad men did not stand up for themselves and for their property with a little more vigor.

"American railroad men are not managing their properties like fools; and yet they have in effect allowed themselves to be called both fools and knaves. It seems strange that there are no railroad men doing for themselves what Mr. Vanderlip has done for Wall street. He expressed himself outspokenly in defense of the financial community and its institutions and refused to allow himself to be branded as an undesirable citizen merely because he was the head of a great financial institution. Railroad men are in an excellent position to make the same sort of stand for themselves, and it seems to me that they most certainly should do so. I can understand why they feel it is useless to fight against the enactment of additional regulatory legislation, but it is an altogether different matter to defend themselves against what seems to me to be the entirely unwarranted charge that the railroads as a whole are being inefficiently and dishonestly managed."

Of the two methods of providing necessary improvements and extensions—the return to the property of surplus earnings and the investment of additional capital—only the latter, Mr. Acworth said, was open to most roads.

Mr. Acworth said he saw no good reason for assuming that in the long run the railroads of the United States could escape a very large increase in their capitalization. Mr. Acworth thought that $15,000 a mile was a liberal estimate of the cost of right-of-way on English railroads. The cost of this item here is, of course, much lower, but this is about the only advantage in the matter of cost, which Mr. Acworth found in a comparison between English railroads and those of the United States. Materials here were no cheaper, and certainly labor was not.

The railroads of this country are suffering for the sins of a past generation. It is neither fair nor expedient to impose upon the railroads of today the penalty for offenses committed in the past. . . . If the railroads are not permitted to go on with their development work sooner or later a railroad blockade will be encountered which will be very much worse than any ever experienced in the past.

On the subject of government ownership of railroads, Mr. Acworth said he felt sure that government ownership would not come about if only the subject were sufficiently discussed in advance. All that was needed, he thought, to prevent a resort to this expedient was free and intelligent public discussion of the proposal.

140,000 Private Cars.

The Interstate Commerce Commission has completed its investigation into ownership of freight cars in the United States, and now for the first time definite figures have been gathered as to the number and character of freight equipment of American railways.

According to the commission's figures there are in the United States 2,300,000 freight cars owned by the railroads and 140,000 cars owned by car companies or other private ownerships. Private parties own more refrigerator cars than the railroads, the private car lines owning 54,000 and the railroads 49,000.

The investigation developed that there are 43,000 freight cars in the United States built specially for the transportation of automobiles.

Early in January the Commission will hold a hearing in Chicago in connection with its investigation of alleged abuses in connection with private cars.

Train Auditors on the M. K. & T.*

The following figures seem to demonstrate the wisdom of our management in inaugurating and maintaining the train auditor system.

In 1903, cash fares paid on trains amounted to $143,361, or 2.934 per cent. of passenger earnings. If we apply the same per cent. to the ticket sales in 1913, it would mean a total of cash

*From a paper by W. S. St. George, General Passenger and Ticket Agent of the Missouri, Kansas & Texas, read at the annual meeting of the General Passenger Agents' Association at Philadelphia.

fare collections for that year of $261,780; but, as a matter of fact, the total of our cash fare collections for the fiscal year ending June 30, 1913, was $464,949, so that after deducting salaries of 89 auditors and other expenses amounting to $130,098, we have still a balance of $73,070 over and above what the collections would have been had the same relative differences existed between cash fares and passenger earnings during the time this feature of our business was handled by conductors. I do not mean to convey the impression that our conductors are dishonest or fail to make correct returns of the cash fare collected. . . . On some of our trains, it would be utterly impossible for any conductor to perform the dual service in a satisfactory manner, and in relieving him of the responsibility of ticket collections we have not only obtained additional revenue from this source but have added to passenger receipts by increasing the efficiency, regularity and popularity of our service.

There is also another feature which should be considered in this connection, and that is, the remarkable freedom we have enjoyed from accidents and damage claims resulting therefrom. During the ten years in which our conductors have been relieved from the collection of fares and have devoted their entire time to the operation of trains, we have only had one death caused by a collision between our own trains, and one of the trains involved in this wreck was without an auditor.—*G. P. & T. A. M. K. & T.*

Quotations from the Wise Men.

"Efficiency" is the title of a little pamphlet of 21 pages, 3¾ in. by 6½ in., which has been issued by W. F. Andrews, general superintendent of transportation of the Queen & Crescent Route (the Cincinnati, New Orleans & Texas Pacific, and the Alabama Great Southern), and as it is marked "No. 1, Volume 1" we assume that the intention is to issue a periodical. While the lectures and admonitions in this pamphlet are addressed to the employees of the roads named and deal with concrete problems, many of which would not be particularly instructive to persons on other roads, it is notable among works of its kind by reason of its distinctive style of composition, and because of the inclusion of much good didactic matter which is applicable not only on other roads but in all walks of life; and sprinkled through the book are quotations from well known philosophers—Ruskin, James Russell Lowell, Thackeray, Phillips Brooks, George Eliot, J. G. Holland, and others.

Following is a sample page, page 3:

Efficiency—Its Meaning.—It means that by conscientious effort we can improve our labor so the result will be self satisfying, thereby making our tasks seem lighter and our lives brighter.

It means less labor to accomplish the same result.

It means that a little efficiency practiced by each one of us will combine to the good of all of us.

"Thank God every morning when you get up that you have something to do that day which must be done, whether you like it or not. Being forced to work, and forced to do your best, will breed in you a hundred virtues which the idle never knew."—Chas. Kingsley.

Efficiency—Qualification Necessary.—To be efficient we must first improve ourselves in accordance with our ability, and as this improvement develops, our capacity for being efficient will develop—therefore the first fruits of efficiency is OUR OWN WORTH INCREASED.

We must be loyal to the organization which employs us, believe in the righteousness of its cause and in its ultimate success, and aim to that end.

Every day we see men of energy whose efforts bring small results. We see men with good qualifications, loyal to a cause and willing to work, but who plod along seemingly unseeing and unthinking, because they have not aimed their energies toward a definite end. They perform as much labor as the efficient man but do not succeed because of their failure to be steadfast in their purpose.

Seven pages are given up to the one subject of courtesy; and the subject is treated from such a variety of standpoints that one naturally questions whether it will not be necessary to have something in the shape of a test or examination in order to learn to what extent employees read the detailed statements; to find out how far the hoped-for results actually materialize. Ticket agents and conductors are appealed to in the following very direct manner:

When a passenger has paid for his ticket, do not throw his change at him in "don't care" sort of a manner; remember to use the expression that is like oil, the "THANK YOU" in kindly tone. A few kind words in a courteous tone will make friends and cost you nothing.

Try it and you will feel better when the day's work is done.

"Kindness—a language which the dumb can speak and the deaf can understand."

A passenger conductor employed on a well-known railroad was known for his courteousness and good nature. He made it a practice when entering the car where perhaps several tired, anxious or discouraged travelers were gathered together, with a hearty "Good Evening, Gentlemen, I'll take your tickets, if you please," and as each ticket was handed him he invariably said "Thank You" in a tone so pleasant that the man in the corner who was about to complain that the train was running too fast or too slow, or making too many or not enough stops, forgot his troubles and fell under the spell of this man's good humor. Very rarely will complaints be made or thought of under these conditions. . . .

Inadequate Pay for Postal Cars.

With reference to statements in the press that the post office committee of the House of Representatives was considering a question that the government own railway postoffice cars instead of paying "rental" to the railroads for their use, Ralph Peters, president of the Long Island and chairman of the Committee on Railway Mail Pay, makes the following statement:

"The government pays the railroads $4,882,000 as annual rental for 1,353 cars, or about $3,400 per car. The steel postal car, with which all railroads must be equipped by 1915, costs about $12,000.

"Postal car pay, which is about 10 per cent. of the total amount paid the railroads for transporting the mails is supplementary pay to make up for the fact that postal cars 60 ft. or 70 ft. in length do not carry sufficient mail to reimburse the railroad company merely for the weight of mail carried. About 75 per cent. of the space in these cars is occupied by pigeon-hole cases and sorting racks.

"Postal cars do not carry all the mail. For the distributing space used in combination baggage cars the government pays absolutely nothing unless they are of 40 ft. or more in length. The weight of mail carried in such compartments is very small, and therefore the major service performed by the railroads is in carrying distributing space. The aggregate space now carried in this manner in 4,029 such cars amounts to 92,866 linear feet, equal to the length of 1,548 full 60-ft. postal cars. Yet for this distributing space in compartment cars the government makes no payment, except for the small amount of dead weight of the mail.

"The payment for postoffice cars, including the pay for weight carried, is about 19 cents for each mile a 60 ft. car runs, whereas all other service on passenger trains pays an average of 26 cents for each mile a car is run. If the supplementary pay for the full postal cars were eliminated, the railroads would only receive about 17 cents a mile for carrying the mail as compared with 26 cents from other passenger service.

"The cost of maintaining and operating a moving postoffice, with its light, heat and fixtures; carrying the necessary clerks and assuming all risks attendant thereto, constitute an annual sum fairly to be compared with the original cost of a car.

"I have no comment to make upon the suggestion that the government should own its own railway postoffice cars, but such a plan cannot be favored fairly upon any plea that the railroads are now overpaid for this portion of the mail service. In fact the railroad officers of the United States feel that the companies are today underpaid by at least $15,000,000 for their service in carrying the mails.

"Persons interested in this subject might well read a published letter from Postmaster General Frank H. Hitchcock, dated and addressed to Hon. John W. Weeks, chairman of Committee on Post Office of the House of Representatives."

New Haven Directors Pass Dividend.

The directors of the New York, New Haven & Hartford, at their meeting in New York City, December 10, voted to declare no dividend, the first action of the kind in the history of this company for forty years or more. In an explanatory statement Chairman Elliott said:

"The New Haven is a strong company, owning valuable property, real estate and securities worth many millions of dollars. Some of this real estate and the property represented by the securities and the securities themselves can in time be marketed, and thus strengthen the cash resources of the company. It is very difficult to sell property and securities at this time, and the directors believe it is unwise to attempt to do so until general conditions are better.

"During the calendar year 1913 the road has already paid dividends of 5 per cent., amounting to $8,657,361.50. For the four months ending October 31, the income available is $3,390,000. Estimating November and December there is a possible total income for six months of $3,890,000. Deducting from this the 1½ per cent. dividend, $2,356,768, paid on September 30, leaves $1,533,231, all of which is required for working capital.

"The company is now entering upon those months where the volume of business is apt, under normal conditions, to be less than during the months July to November inclusive. The arbitration of wage disputes in the last eighteen months has resulted in increases in pay that will increase expenses for the present fiscal year between $800,000 and $1,000,000 for the same number of employees. The improvements to which the company is already committed, in the interest of safety, efficiency and greater convenience to the public, will take large sums of money. There are important lawsuits and investigations pending, the results of which are uncertain in their effect upon the general financial and corporate condition of the property.

"The directors feel, therefore, that the welfare of the company, of the stockholders, and of the territory served by the various lines will be conserved better under all the conditions now confronting the company by not declaring at this time a dividend."

American Electric Railway Association and American Electric Railway Manufacturers' Association.

The midyear meeting of the American Electric Railway Association will be held at the Engineers' Society Building, New York, on January 29, 30 and 31. The annual dinner will be held at the Waldorf-Astoria on the evening of Thursday, January 29. There will be a change in the arrangements this year in accordance with the resolutions of the executive committee passed at its meeting in Atlantic City, in that, instead of being a complimentary affair the dinner will be one where each may pay his own way. Any subscriber may invite as many guests as he wishes. The program of the speakers is now being prepared and will be announced later.

American Railway Safety Association.

The American Railway Safety Association has called a meeting to be held at the Manhattan Hotel, New York City, on December 13.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass. Next convention, May, 1914.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass. Convention, May 19, 1914, St. Louis.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill. Next convention, April 21, Houston, Tex.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, St. Louis, Mo.; 3d Thursday and Friday in May.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 29 W. 39th St., New York. Mid-year conference, New York, January 29, 30, 31.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOC.—H. G. McConnaughy, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 20-22, 1914, Los Angeles, Cal.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 17-20, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Karpen building, Chicago. June 15-17, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—A. R. Davis, Central of Georgia, Macon, Ga.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 West 57th St., New York; 1st and 3d Wed., except June and August, New York.

AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wenlinger, 11 Broadway, New York; 2d Tuesday of each month, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Next convention, January 20-22, 1914, New Orleans, La.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, Highland Park, Ill. Annual meeting, June 24, Minneapolis, Minn.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—C. W. Egan, B. & O., Baltimore, Md. Next convention, May, 1914, St. Paul, Minn.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 112 West Adams St., Chicago. Next convention, May 20-23, New Orleans, La.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.

ASSOCIATION OF WATER LINE ACCOUNTING OFFICERS.—W. R. Evans, Chamber of Commerce, Buffalo, N. Y.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—L. D. Mitchell, Detroit Graphite Co., Detroit, Mich. Meeting with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and August, Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursday, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after second Saturday, Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, Oliver building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va. Next convention, May 20-22, Galveston, Tex.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, 922 McCormick building, Chicago. Annual convention, May 18-22, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 829 West Broadway, Winona, Minn. Next Convention, July, Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Next convention, third Tuesday in August.

MAINTENANCE OF WAY & MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—T. I. Goodwin, C. R. I. & P., Eldon, Mo. Next convention, November 17-19, 1914, Detroit, Mich.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Karpen building, Chicago. June 10-12, Atlantic City, N. J.

MASTER CAR & LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass.

NATIONAL RAILWAY APPLIANCE ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3rd Friday in month, except June, July and August, New York.

NORTHERN RAILROAD CLUB.—C. L. Kennedy, C. M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, Union Station, Peoria; 2d Thursday.

RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Mobile & Ohio, Mobile Ala.

RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo.

RAILWAY DEVELOPMENT ASSOCIATION.—W. Nicholson, Kansas City Southern, Kansas City, Mo.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.

RAILWAY TEL. & TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill. Next convention, September 8-10, 1914, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meeting with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillsburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next convention, June 16, Jacksonville, Fla.

TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Next meeting, Chicago.

UTAH SOCIETY OF ENGINEERS.—Fred D. Ulmer, Oregon Short Line, Salt Lake City, Utah; 3rd Friday of each month, except July and August.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, Karpen building, Chicago; 3d Tuesday of each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

Traffic News.

The New York State canals were closed on the night of November 30, about 15 days later than usual. The Erie Canal was open 170 days.

The Traffic Club of St. Louis has adopted resolutions favoring the proposed 5 per cent. advance in freight rates in Official Classification territory.

The Chicago & Eastern Illinois on December 7 re-established the Dixie Limited train, which will be run between Chicago and Florida during the winter season.

The New York Produce Exchange has complained to the Interstate Commerce Commission that rates on grain from Lake Erie ports to New York are unduly high, giving an unfair advantage to Montreal.

The Boston & Maine has notified its freight agents in the state of Maine that shippers of liquors must sign a statement that the consignment is not to be received, sold or possessed in violation of state or federal laws.

The Copper Range Railroad has opened an extension, four miles long, southward from the present southern terminus of its Painesdale branch to a point near Toivola, Mich., passing through South Range, Baltic, and Trimountain.

At a meeting of the Western Passenger Association last week it was decided to offer the same rates for summer tourist fares next year as have been in effect the past season. The retiring members of the executive committee of the association were re-elected.

The New York, New Haven & Hartford has given up its option on 36,000 acres of lands in Washington county, Maine, which was taken in 1911. It had been the intention of the road, through its industrial department, to conduct agricultural demonstrations on a large scale.

Grain shipments through New Orleans continue exceedingly heavy. The elevators of the Illinois Central and the Texas & Pacific are kept very busy. Combined railroad and ocean rates on grain now favor shipments through New Orleans as compared with Atlantic seaboard ports.

The United States District Court has sustained the order of the Alabama Railroad Commission, requiring the adoption of 2½ cents a mile as the rate for passenger fares on the South & North Alabama, the change to go into effect January 1 next. This road is that part of the Louisville & Nashville between Decatur and Montgomery, 182 miles.

The Pennsylvania Railroad's agricultural demonstration train, consisting of four cars, recently arrived in Philadelphia after making trips over the lines of the company, covering about five months. At most of the towns visited the car was stopped for two days. One car contains displays of fruits and vegetables, another has a complete dairy exhibit, and a third is a milk car, 75 ft. long. The fourth car of the train is a model stock car. Men from the department of agriculture are in charge of the exhibits.

George F. Moore, president of the Manufacturers' Railway, St. Louis, says that under the recent decision of the Supreme Court in the "tap line" cases, his company expects to restore its old tariffs under which the railroads entering the city absorb the charges of the Manufacturers' road. The Chicago, Peoria & St. Louis and the St. Louis Southwestern have already filed tariffs restoring the allowances formerly made to the Manufacturers' Railway. These tariffs were filed December 7, to go into effect January 7.

Ex-President W. H. Taft, as attorney for the trustees of the Cincinnati Southern, and as referee in the controversy in which Cincinnati shippers charged that the Cincinnati, New Orleans & Texas Pacific is discriminating against the city in freight rates over the road, extending from Cincinnati to Chattanooga, Tenn., which was leased by the city to the C. N. O. & T. P., has rendered a decision that the complainants have not made out a case strong enough to warrant the trustees taking action against the lessees. Attorneys for both sides had agreed to abide by his decision. The Cincinnati shippers have been fighting for a reduction of the rates to Chattanooga and the southeast for 22 years, and the case has been twice before the Interstate Commerce Commission, once before the Commerce Court and twice before the Supreme Court. The commission ordered a reduction of the rates in 1894, but the Supreme Court held it was without power to establish rates. Later the commission ordered a slight reduction, which did not satisfy the shippers.

E. C. Hoag has been appointed supervisor of farm marketing of the St. Louis & San Francisco and will be in charge of a new branch of the company's department of development. W. B. Biddle, chief traffic officer of the Frisco, has outlined the purposes of the new work as follows: "We expect farm marketing to be one of the important features of the work of the department of development. We do not expect to revolutionize the present system of marketing in a day, but investigations covering a period of more than a year convince us that a decided improvement can be made in the interest of both producer and buyer. A great many markets heretofore unsupplied or insufficiently supplied will consume a great share of the products for which the farmers along our lines have not so far been able to find a market. We have also satisfied ourselves that along our own rails markets for a great share of the products produced by the farmers in our territory can be found. There should be a larger interchange of business between various sections along our lines. Bringing this about will result in improved markets for our producers. One of the evils which has resulted in great loss to the producers has been improper grading and packing. The department of development has given its attention for the greater part of the past year to the formation of such grading and packing organizations as would establish a standard for the various products. This we believe will not only enable the producers to better and more profitably sell their output, but will assure the buyers of a standard that they can rely upon. We are inviting the cooperation of both producers and buyers in working out the problem."

Reorganization of the Western Classification Committee.

The executive board of the Western Classification Committee at a meeting on December 5, approved the plan for the reorganization of the classification committee and the appointment of a permanent committee of three, to be in continuous session, to hear petitions of shippers or carriers for changes in the Western Classification Committee territory, and make recommendations thereon for adoption in that territory by the western lines.

The board elected H. C. Bush, formerly traffic manager of the Colorado Midland; W. E. Prendergast, general freight agent of the Chicago, Milwaukee & St. Paul, and R. C. Fyfe, present chairman of the Western Classification Committee and a member of the Committee on Uniform Classification, as the permanent committee. Mr. Fyfe will continue as chairman. It will be the work of this committee to receive all applications for changes in classification presented either by the shipping public or the carriers, to make full investigation, and to hold public hearings to which representatives of the Interstate Commerce Commission, state railroad commissioners, and industrial organizations interested will be invited. Also the Interstate Commerce Commission has been invited to have a representative present at the executive sessions of the committee.

This reorganization of the Western Classification Committee is in line with the recommendations of the National Industrial Traffic League and prominent shippers' organizations, and it is understood is looked upon with favor by the western state railroad commissions and shippers as it will greatly facilitate the prompt handling of classification matters and will avoid delays which have occurred in the past when only two classification meetings per year were held by the Western Classification Committee.

The committee of three will, where it is found necessary, or desirable, hold hearings at points throughout the western territory; however, the permanent headquarters and the committee meeting rooms will be located on the eighteenth floor of the Transportation Building, Chicago.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF OCTOBER, 1913.

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total, inc. misc.	Operating expenses: Maintenance: Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.	Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Alabama Great Southern	309	$361,238	$108,707	$510,930	$60,449	$124,848	$13,149	$163,246	$11,349	$373,041	$137,889	$194	$15,700	$122,383	—$27,547
Ann Arbor	292	150,378	45,809	210,020	20,114	28,545	5,466	68,611	6,958	129,694	80,326	3	13,930	66,399	10,032
Arizona Eastern	367	192,321	40,704	243,345	27,122	34,569	2,214	62,576	10,982	137,463	105,882	—149	14,646	91,087	—32,312
Atchison, Topeka & Santa Fe	8,357	5,891,454	2,083,320	8,666,331	1,122,562	1,572,753	173,165	2,371,318	184,065	5,423,863	3,242,468	.....	388,959	2,853,509	—137,805
Atlanta & West Point	93	70,519	40,751	124,537	15,004	21,465	5,062	35,215	5,221	81,967	42,570	256	6,484	36,342	4,912
Atlantic & St. Lawrence	167	80,750	28,200	119,704	27,578	21,890	4,032	58,965	5,626	116,091	3,613	.....	10,157	—6,544	4,069
Atlantic City	167	70,812	64,592	148,499	54,221	10,886	2,295	83,677	1,276	152,355	—3,856	—4,133	9,000	—16,989	—9,219
Baltimore & Ohio—System	4,456	7,322,404	1,522,394	9,337,970	1,212,137	1,729,342	225,584	3,588,085	177,857	6,933,005	2,404,965	—73,911	266,750	2,064,304	—735,063
Bangor & Aroostook	631	301,253	74,655	392,181	40,484	43,852	2,614	108,933	10,269	206,152	186,029	—430	9,758	175,841	55,728
Belt Ry. Co. of Chicago	21	.....	.....	250,277	39,880	21,317	516	99,442	4,939	166,094	84,183	.....	9,708	74,475	—32,760
Bingham & Garfield	26	156,145	4,211	161,308	9,545	21,887	813	21,192	4,009	57,446	103,862	.....	2,765	101,097	84,543
Butte, Anaconda & Pacific	90	101,269	9,919	122,126	20,708	21,793	566	49,654	3,097	95,818	26,308	.....	2,900	23,408	10,754
Canadian Pacific Lines in Maine	233	62,522	22,390	94,984	47,921	15,053	6,784	40,511	5,073	115,342	—20,358	.....	11,000	—31,358	—16,152
Central of Georgia	1,924	1,120,770	340,058	1,605,613	174,385	289,461	35,389	447,834	42,729	989,798	615,815	4,967	47,866	572,916	79,400
Central New England	304	305,636	44,223	365,007	48,264	43,708	1,463	113,991	3,689	211,115	153,892	—1,082	10,500	142,310	1,518
Central Vermont	411	250,907	100,910	376,253	68,786	82,251	12,649	176,861	9,873	350,420	25,833	297	15,500	10,630	—41,772
Chesapeake & Ohio Lines	2,339	2,534,152	541,830	3,215,467	351,320	674,894	55,050	997,128	75,189	2,153,581	1,061,886	7,292	109,960	959,218	—6,039
Chicago & Erie	270	392,270	63,965	495,167	122,645	125,692	22,711	249,514	14,753	535,315	—40,148	—3,862	16,029	—60,039	—97,177
Chicago Great Western	1,496	924,300	288,993	1,312,617	238,043	218,248	44,263	492,320	35,538	1,028,412	284,205	—175	38,650	245,380	—150,440
Chicago, Indiana & Southern	359	343,407	27,953	384,272	74,027	92,796	6,361	124,484	10,404	308,072	76,200	308	15,283	61,225	—56,728
Chicago, Milwaukee & St. Paul	9,690	6,865,107	1,722,743	9,246,434	1,154,084	1,185,567	165,316	3,007,339	145,534	5,657,840	3,588,594	16,410	331,773	3,273,231	—392,296
Chicago, Peoria & St. Louis	255	131,825	35,145	176,180	35,859	33,764	7,710	78,228	4,824	160,385	15,795	.....	4,800	10,995	—7,195
Cincinnati, New Orleans & Texas Pacific	337	762,306	152,696	958,471	95,427	251,106	24,133	269,589	22,061	662,316	296,155	—2,070	31,000	263,085	—12,059
Cincinnati Northern	245	135,683	16,720	158,185	34,314	39,508	3,270	65,321	3,811	146,224	11,961	.....	5,500	6,461	—36,106
Cleveland, Cincinnati, Chic. & St. Louis	2,014	2,081,176	681,630	3,045,934	352,570	752,605	90,189	1,238,891	65,128	2,499,383	546,551	—584	115,000	430,967	—524,125
Colorado & Southern	1,127	550,034	118,884	715,083	101,560	177,390	10,467	221,905	23,296	534,618	180,465	—1,126	35,675	143,664	—107,995
Denver & Rio Grande	2,585	1,865,271	533,847	2,488,916	274,942	410,706	40,946	756,744	54,218	1,537,556	951,360	1,005	97,000	855,365	—7,271
Detroit, Toledo & Ironton	441	117,860	11,373	144,091	44,625	30,607	2,324	71,709	5,452	154,717	—10,626	.....	5,700	—16,326	—53,648
Detroit, Grand Haven & Milwaukee	191	153,000	66,000	250,304	26,460	29,169	6,246	111,664	6,214	179,753	70,551	75	3,600	67,026	31,902
Detroit River Tunnel	2	.....	.....	107,443	2,223	2,876	.....	9,545	37	14,681	92,762	.....	2,500	90,262	4,766
Detroit & Toledo Shore Line	79	140,533	.....	141,409	16,560	8,078	1,613	35,873	2,731	64,855	76,554	.....	5,900	70,654	14,598
Duluth, South Shore & Atlantic	627	212,450	105,914	342,986	83,665	38,925	8,775	116,084	8,576	256,025	86,961	299	18,000	69,260	31,372
Duluth, Winnipeg & Pacific	166	127,973	23,379	154,776	40,467	14,562	940	63,728	7,572	127,269	27,507	.....	7,739	19,768	—6,417
Erie	1,988	3,723,452	806,647	4,905,975	733,011	972,428	107,191	1,634,860	101,170	3,548,660	1,357,315	1,493	162,364	196,444	—337,948
Florida East Coast	696	187,587	107,960	338,356	78,132	64,955	12,138	133,334	13,105	301,664	36,692	—1,445	20,000	15,247	—30,265
Fort Worth & Denver City	454	320,141	130,356	473,014	60,775	72,456	6,331	185,120	17,138	341,820	131,194	—372	18,200	112,622	—119,471
Galveston, Harrisburg & San Antonio	1,339	793,788	277,273	1,132,180	123,511	206,225	36,721	437,393	32,537	836,387	295,793	—2,508	56,939	236,346	—105,315
Georgia, Southern & Florida	395	148,433	74,210	246,480	30,355	43,019	8,459	90,582	11,321	183,736	62,744	.....	10,658	52,086	20,656
Grand Trunk Western	347	405,000	216,000	650,894	39,184	111,388	20,122	294,854	17,581	483,129	167,765	—2,199	31,500	134,066	—23,561
Great Northern	7,748	6,817,493	1,526,521	8,814,185	1,138,389	902,197	132,192	2,124,604	117,249	4,414,631	4,399,554	5,999	434,906	3,970,647	—309,369
Gulf, Colorado & Santa Fe	1,596	877,995	272,241	1,228,848	158,284	190,261	26,993	465,142	32,256	872,936	355,912	.....	55,681	300,231	—180,499
Hocking Valley	352	611,743	83,898	739,594	68,367	110,949	9,227	236,480	14,838	439,861	299,733	.....	41,000	258,733	15,391
Houston, East & West Texas	191	87,220	30,129	125,788	21,479	13,858	2,065	73,677	4,277	115,356	10,432	.....	5,473	4,959	—37,332
Houston & Texas Central	789	440,442	178,533	664,130	73,890	75,970	15,674	295,075	17,917	478,526	185,604	1,716	29,781	157,539	—75,085
Indiana Harbor Belt	105	.....	.....	304,951	42,175	35,089	2,430	142,974	8,054	230,722	74,229	3,490	5,500	72,219	—11,142
International & Great Northern	1,160	790,108	205,287	1,066,726	130,191	109,847	25,791	399,805	34,129	699,763	366,963	—826	25,000	341,137	—217,719
Kanawha & Michigan	177	270,387	33,365	311,036	40,837	68,510	3,343	92,056	7,176	211,922	99,114	—10	9,499	89,605	—17,592
Lake Erie & Western	906	429,877	69,969	532,941	91,448	102,225	14,063	207,110	12,041	426,887	106,054	.....	22,394	83,660	—65,372
Lake Shore & Michigan Southern	1,853	3,321,707	1,053,274	4,952,108	646,936	1,215,169	98,452	1,793,421	97,433	3,851,411	1,100,697	14,164	165,000	949,861	—1,040,500
Lehigh & Hudson River	97	154,962	3,824	167,823	34,345	34,085	2,077	57,927	4,752	133,186	34,637	.....	4,000	30,637	—23,561
Lehigh & New England	269	178,904	763	183,697	24,282	21,128	5,186	42,705	4,057	97,358	86,339	.....	3,178	83,161	7,979
Louisiana Ry. & Navigation	351	122,887	21,210	153,932	34,056	22,106	6,109	65,414	6,625	134,310	19,622	.....	5,500	14,122	—37,875
Louisville, Henderson & St. Louis	200	82,942	36,713	127,084	25,237	16,329	4,873	38,824	3,217	88,480	38,604	361	3,600	35,365	19,101
Michigan Central	1,819	2,144,358	773,855	3,252,502	522,991	602,626	66,887	1,337,328	52,713	2,582,545	669,957	1,952	116,000	555,909	—517,630
Midland Valley	373	122,042	45,155	175,187	31,337	28,348	2,699	55,296	6,719	124,399	50,788	140	5,986	44,942	—7,793
Minneapolis & St. Louis	1,586	722,892	165,184	939,984	138,911	126,099	18,181	340,582	19,794	643,567	296,417	—137	36,789	259,491	—44,237
Minneapolis, St. Paul & Sault Ste. Marie	3,979	2,324,478	626,015	3,113,587	324,238	407,438	54,822	898,581	52,156	1,737,235	1,376,352	19,128	140,026	1,255,454	—495,218
Missouri, Kansas & Texas System	3,817	2,065,841	848,604	3,113,917	457,729	402,327	62,557	1,108,181	103,188	2,133,982	979,935	—12,149	161,608	806,178	—628,125
Missouri Pacific	3,920	1,931,517	452,079	2,582,312	481,809	476,584	60,662	1,028,437	73,596	2,120,688	461,624	—3,719	95,900	362,005	—125,813
Nashville, Chattanooga & St. Louis	1,231	787,681	289,488	1,155,150	175,323	202,696	40,295	413,753	30,028	862,095	293,055	—1,343	25,340	266,372	—13,111
Nevada Northern	165	141,604	11,801	157,046	16,949	18,733	435	39,765	4,218	80,100	76,946	.....	13,213	63,733	32,545
New Orleans Great Northern	283	128,743	32,840	175,787	22,294	21,060	2,899	48,370	7,873	102,496	73,291	—87	2,334	70,870	30,610
New York Central & Hudson River	3,751	6,612,253	2,977,430	10,780,194	1,712,007	2,102,819	199,388	3,734,171	241,028	7,989,413	2,790,781	3,625	776,786	2,017,620	—545,821
New York, Chicago & St. Louis	566	943,622	139,015	1,118,171	121,741	183,494	54,759	464,816	19,987	844,797	273,374	—4,610	39,000	229,764	—193,578
New York, New Haven & Hartford	2,060	3,039,756	2,375,167	6,083,491	815,983	834,125	37,448	2,358,962	140,653	4,187,171	1,896,320	12,045	300,000	1,608,365	—625,079
New York, Ontario & Western	566	631,727	105,058	776,934	143,841	139,491	10,089	292,308	14,306	600,035	176,899	—2,794	20,000	154,105	—50,403
New York, Susquehanna & Western	154	196,352	46,754	272,667	39,578	33,806	2,805	107,867	5,793	189,849	82,818	660	13,970	69,508	12,120
Norfolk & Western	2,035	3,565,122	441,544	4,139,509	482,898	903,675	75,509	1,265,966	84,257	2,812,305	1,327,204	—110	125,000	1,202,095	—81,361
Oregon Short Line	2,023	1,933,660	470,134	2,536,001	276,069	253,159	33,116	547,717	55,792	1,165,853	1,370,148	—176	117,800	1,252,172	156,135
Oregon-Washington R. R. & Nav. Co.	1,914	1,237,789	449,532	1,811,300	296,182	194,718	47,971	559,423	58,885	1,157,179	654,121	—8,981	112,968	532,172	—66,771

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF OCTOBER, 1913—CONTINUED.

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total, inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Pecos & Northern Texas	482	192,391	41,630	245,628	24,479	46,592	731	68,783	7,602	148,187	97,441	.....	8,826	88,615	—15,972
Peoria & Eastern	352	198,290	63,409	285,223	31,801	29,087	6,476	121,514	5,822	194,700	90,523	.....	12,400	78,123	—14,549
Pere Marquette	2,325	1,145,471	332,708	1,611,720	225,213	379,873	34,193	630,328	47,855	1,317,462	294,258	5,239	49,792	249,705	—159,035
Philadelphia & Reading	1,020	3,710,745	614,995	4,537,230	473,231	876,156	52,550	1,402,239	65,425	2,869,601	1,667,629	6,193	102,565	1,571,257	—491,090
Pittsburgh & Lake Erie	223	1,544,584	153,092	1,759,121	173,307	338,076	21,005	421,706	28,087	982,181	776,940	660	57,000	720,600	—267,552
Pittsburgh, Shawmut & Northern	282	198,213	10,468	211,349	51,994	57,903	2,625	70,776	5,423	188,721	22,628	.....	1,845	20,783	—47,747
Port Reading	21	112,459	.....	113,468	13,334	219	30	33,255	1,759	48,597	64,871	9,689	10,000	64,560	—61,991
Richmond, Fredericksburg & Potomac	88	115,853	82,418	230,710	24,082	32,663	2,963	89,467	6,838	156,013	74,697	—885	8,683	65,129	770
St. Joseph & Grand Island	319	91,851	38,444	141,672	31,878	24,009	5,055	54,792	6,426	122,160	19,512	57	6,244	13,325	—19,499
St. Louis & San Francisco	4,742	2,854,704	940,053	4,085,191	567,614	619,862	69,282	1,323,914	92,038	2,672,710	1,412,481	.....	135,094	1,277,387	—157,771
St. Louis, Brownsville & Mexico	518	115,767	65,999	197,380	64,289	24,112	4,480	82,018	11,967	186,866	10,514	.....	5,500	5,014	—45,808
St. Louis, Iron Mountain & Southern	3,365	2,277,508	526,915	3,010,473	450,973	453,158	49,562	857,551	71,779	1,883,023	1,127,450	—2,745	96,135	1,028,570	110,649
St. Louis Merchants' Bridge Terminal	9	.....	486	189,813	33,309	12,640	744	95,879	6,159	148,731	41,082	.....	5,600	35,482	—26,896
St. Louis Southwestern	905	566,055	124,197	729,784	69,407	153,342	30,129	176,837	29,752	459,467	270,317	—1,477	30,232	238,608	—85,309
San Pedro, Los Angeles & Salt Lake	1,133	589,092	272,008	928,496	103,767	152,142	33,074	304,886	18,726	612,595	315,901	—3,946	39,974	271,981	—35,036
Seaboard	3,082	1,610,045	434,167	2,247,453	282,632	300,160	70,800	766,325	66,686	1,486,603	760,850	—688	82,000	678,162	13,310
Southern	7,037	4,572,339	1,612,093	6,674,385	753,971	1,061,169	189,419	2,143,344	179,447	4,327,350	2,347,035	17,284	216,620	2,147,699	102,596
Southern Kansas of Texas	179	126,009	18,035	149,116	26,688	30,329	—48	39,591	3,912	100,472	48,644	.....	4,507	44,137	—20,919
Spokane International	163	74,968	23,934	102,889	14,007	4,749	2,197	28,611	3,835	53,399	49,490	.....	3,020	46,470	1,741
Spokane, Portland & Seattle	556	314,477	137,384	507,301	58,100	36,102	7,571	112,326	13,636	227,735	279,566	—768	53,400	225,398	—9,019
Terminal Railroad Ass'n of St. Louis	34	.....	257	273,022	48,302	22,243	949	100,401	4,212	176,107	96,915	2,431	26,700	72,646	—31,054
Texas & New Orleans	458	221,955	102,355	352,936	44,384	94,683	8,502	150,005	12,968	310,542	42,394	2,948	19,376	25,966	—2,325
Texas & Pacific	1,885	1,221,298	425,861	1,857,354	137,140	196,479	38,163	694,035	44,196	1,110,013	747,341	—8,869	48,000	690,472	—17,445
Toledo & Ohio Central	443	453,423	55,736	540,806	85,655	116,510	15,539	212,924	9,560	440,188	100,618	—370	19,117	81,131	—81,852
Toledo, St. Louis & Western	451	361,416	30,160	415,184	47,700	55,107	15,689	144,584	9,250	272,330	142,854	.....	16,600	126,254	37,129
Trinity & Brazos Valley	463	187,516	48,073	247,158	51,612	31,530	10,370	110,530	13,479	217,521	29,637	.....	6,995	22,642	—93,285
Vicksburg, Shreveport & Pacific	171	98,821	46,412	158,556	26,770	32,700	3,492	49,331	5,340	117,633	40,923	—105	7,800	33,018	—7,255
Virginia & Southwestern	240	156,237	17,106	178,042	21,655	37,061	2,177	48,800	4,287	113,980	64,062	.....	6,181	57,881	12,726
Virginian	503	625,697	33,031	673,526	82,835	80,054	5,925	137,634	9,900	316,348	357,178	7,667	22,650	342,195	144,526
Wabash	2,515	1,962,683	668,530	2,867,240	305,141	488,021	96,262	1,140,554	72,533	2,102,511	764,729	—4,832	74,447	685,450	—121,674
Washington Southern	36	34,833	39,027	102,943	17,177	15,705	1,342	41,222	3,506	78,952	23,991	—198	3,468	20,325	—7,178
Western Pacific	937	539,506	133,087	688,402	139,481	68,969	27,349	231,276	24,188	491,263	197,139	—1,640	31,707	163,792	—66,828
Western Ry. of Alabama	133	90,790	49,468	152,637	22,639	24,868	6,636	38,384	6,630	99,157	53,480	—231	4,838	48,411	2,665

FOUR MONTHS OF FISCAL YEAR, 1914.

Alabama & Vicksburg	143	$400,818	$176,187	$622,992	$89,147	$128,654	$15,431	$216,513	$22,964	$472,709	$150,283	—$2,363	$29,800	$118,120	—$37,454
Arizona & New Mexico	109	281,456	37,082	334,079	47,457	34,369	3,003	63,038	12,155	160,022	174,057	.....	13,600	160,457	—43,445
Alabama Great Southern	309	$1,203,535	$478,748	$1,828,804	$222,341	$453,755	$53,857	$598,180	$38,516	$1,366,649	$462,155	—$875	$62,400	$398,880	—$66,183
Ann Arbor	292	497,468	222,107	771,038	92,280	100,760	19,708	255,447	26,497	494,692	276,346	—150	55,720	220,476	17,202
Arizona Eastern	367	700,630	155,315	900,068	118,637	132,484	8,377	253,742	44,398	557,638	342,430	—109	51,585	290,736	—130,379
Atchison, Topeka & Santa Fe	8,357	21,598,445	8,615,866	32,649,588	4,828,119	5,806,807	688,068	8,930,881	730,747	20,984,622	11,664,966	.....	1,516,036	10,148,930	—110,085
Atlanta & West Point	93	216,706	171,043	429,236	63,250	86,924	20,304	130,787	19,327	320,592	108,644	1,008	25,937	83,715	—10,362
Atlanta, Birmingham & Atlantic	645	819,231	244,916	1,156,551	188,397	193,498	56,249	444,664	44,373	927,181	229,370	.....	57,347	172,023	25,020
Atlantic & St. Lawrence	167	299,755	143,568	483,572	114,461	75,279	16,380	232,572	15,893	454,585	28,987	.....	40,628	—11,641	27,407
Atlantic City	167	280,469	845,049	1,185,080	133,333	49,645	15,907	512,182	7,482	718,549	466,531	—16,661	36,000	413,870	48,940
Atlantic Coast Line	4,619	7,006,187	2,733,739	10,517,149	1,704,481	1,929,128	192,800	3,953,257	392,865	8,172,531	2,344,618	.....	528,000	1,816,618	—304,221
Baltimore & Ohio Chicago Terminal	77	.....	3,347	627,729	86,899	79,475	2,803	274,163	20,453	463,793	163,936	3,765	64,207	103,494	—5,516
Baltimore & Ohio—System	4,456	28,471,415	6,400,067	36,817,788	4,891,573	6,103,562	811,764	13,353,821	765,912	25,926,632	10,891,156	—288,356	1,061,487	9,541,313	—223,676
Bangor & Aroostook	631	825,701	274,327	1,157,753	161,959	172,273	10,192	373,080	43,141	760,645	397,108	—30	39,030	358,048	47,720
Belt Ry. Co. of Chicago	21	.....	.....	1,004,169	107,354	120,201	2,174	394,201	24,298	648,228	355,941	.....	38,922	317,019	—83,489
Bessemer & Lake Erie	204	3,895,050	186,177	4,131,192	347,871	694,376	46,642	912,020	46,201	2,047,110	2,084,082	.....	152,000	1,932,082	—156,749
Bingham & Garfield	26	566,046	17,606	586,394	31,766	81,487	3,789	91,288	11,117	219,447	366,947	.....	11,416	355,531	148,000
Birmingham Southern	43	265,083	4,248	442,233	64,427	51,028	2,035	145,771	16,919	280,180	162,053	.....	7,220	154,833	23,512
Boston & Maine	2,252	9,708,665	6,563,596	17,552,473	2,563,686	2,631,463	148,881	7,405,258	405,990	13,155,278	4,397,195	80,831	641,483	3,836,543	—825,719
Buffalo & Susquehanna *Railroad*	253	579,817	36,294	631,901	120,962	92,518	7,574	207,998	25,783	454,835	177,066	.....	8,800	168,266	9,379
Buffalo & Susquehanna *Ry*	91	155,264	47,241	214,459	46,834	114,238	2,555	86,708	12,738	263,073	—48,614	1	6,400	—55,013	—24,936
Buffalo, Rochester & Pittsburgh	576	3,712,541	476,934	4,344,444	620,497	816,700	54,878	1,385,866	77,964	2,955,905	1,388,539	174	72,000	1,316,713	142,527
Butte, Anaconda & Pacific	90	389,438	65,473	496,013	70,347	78,159	2,634	181,899	14,343	347,382	148,631	.....	9,650	138,981	74,528
Canadian Pacific Lines in Maine	233	197,807	95,982	329,865	159,751	59,944	25,655	148,524	20,009	413,883	—84,018	.....	44,000	—128,018	—21,821
Carolina, Clinchfield & Ohio	248	845,720	84,576	950,675	67,520	107,804	27,249	165,604	34,262	402,439	548,236	.....	37,000	511,236	44,508
Carolina, Clinch. & Ohio Ry. Co. of S. C.	18	46,308	7,820	55,179	2,397	348	6,133	10,082	2,039	20,999	34,180	.....	3,000	31,180	4,778
Central of Georgia	1,924	3,111,448	1,347,289	4,853,658	661,271	1,006,619	139,127	1,601,325	158,870	3,567,212	1,286,446	26,479	199,072	1,113,853	—139,308
Central of New Jersey	676	7,213,358	2,273,881	9,840,357	1,064,922	1,520,612	137,102	2,930,276	174,665	5,827,577	4,012,780	139,429	431,085	3,721,124	—761,020
Central New England	304	1,073,241	167,640	1,294,897	198,128	147,386	5,027	355,440	19,829	725,810	569,087	—250	42,000	526,837	—99,593
Central Vermont	411	941,502	471,154	1,518,580	300,267	267,711	37,433	697,870	32,770	1,336,051	182,529	2,831	62,000	123,360	—157,668
Charleston & Western Carolina	341	519,755	133,050	681,404	128,983	114,976	13,283	248,462	18,347	524,051	157,353	.....	20,000	137,353	53,931
Chesapeake & Ohio Lines	2,339	9,552,970	2,346,072	12,444,139	1,450,058	2,421,683	220,012	3,869,144	297,366	8,258,263	4,185,876	11,176	439,840	3,757,212	—5,069
Chicago & Alton	1,032	3,555,030	1,637,650	5,377,275	715,628	1,276,102	162,517	1,981,164	141,060	4,276,471	1,300,804	—10,467	159,200	1,131,137	—349,694
Chicago & Eastern Illinois	1,282	4,219,872	1,105,024	5,771,299	1,121,350	1,365,732	91,227	2,044,572	155,330	4,778,211	993,088	—11,767	180,000	801,321	—509,796

INTERSTATE COMMERCE COMMISSION.

The commission has further suspended until June 11 certain schedules in tariffs of the St. Louis & San Francisco, which proposed to cancel through rates and charges between points on the Kansas City & Memphis and points on, or reached via, the St. Louis & San Francisco.

The commission has concluded to order a reargument of the Tap Line case. It has already perfected an appeal to the Supreme Court from the recent decision of the Commerce Court, and now wishes to determine whether it would be wiser to prosecute the appeal or to modify its own order in the case. The reargument is set for January.

The commission has asked that all applications for extension of time under the terms of the Panama Canal act be filed not later than March 1, 1914. This act prohibits after July 1, 1914, any interest by a railroad or other common carrier, in any common carrier by water, when the former may compete with the latter. The commission has authority to determine questions of fact as to such competition, and it is allowed to extend the time beyond July 1, during which a railroad, or other common carrier, may continue the operation of service by water, if such service is of advantage to the public and if such extension will not reduce or prevent competition on the water route under consideration.

Classification of Iron and Steel Window Frames and Sash.

Report by Commissioner Clements:

Protests having been made against certain tariffs which proposed to change the classification to fourth class on glazed or unglazed sash in straight or mixed carloads shipped to Texarkana, Ark., and points in Louisiana, Texas and Mexico, the respondents are now willing to establish fifth-class rates on window frames and glazed or unglazed sash in straight or mixed carloads, minimum weight, 26,000 lbs., with graduated minima as heretofore from official classification territory. (28 I. C. C., 500.)

STATE COMMISSIONS.

The Louisiana Railroad Commission has ordered the Illinois Central, the Yazoo & Mississippi Valley and the Texas & Pacific to install on their main lines in the state "an approved block system such as will reasonably conserve the safety of life and property," at the rate of at least 20 miles each year, beginning January 1, 1914. The railroads affected opposed the order issued by the commission on the ground of great expense, which they declared to be unjustified and unnecessary. It seems probable that they will take the subject into the courts.

The Louisiana railroad commission has declined to establish uniform class mileage rates for freight on those railroads in Louisiana which use the Western classification. This subject has been pending for the past year. The commission decides that it would be impracticable and unjust to establish the uniform rate. No discretion would be left with the commission to fix rates to conform to particular conditions existing on different roads, and the effect would be to compel some of the smaller roads to carry commodities at a loss, or without profit, in various instances, in order to compete with stronger railroads. The uniform rate proposal was vigorously opposed by the New Orleans Board of Trade and by the railroads, while Shreveport, Alexandria, Ruston, Baton Rouge and other towns strongly advocated it. Another reason for holding that it would be illegal for the commission to fix a uniform mileage rate, was that the state courts had held that all rates should be reasonable.

COURT NEWS.

The United States circuit court of appeals at Cincinnati has rendered a decision ordering the district court to grant a new trial of the suit against the Chesapeake & Ohio, begun by the heirs of Thomas McKell, who obtained judgment for $300,000 for breach of contract in failing to provide facilities for hauling coal from McKell's mines in West Virginia.

Railway Officers.

Executive, Financial and Legal Officers.

John G. Sutton has been elected vice-president and general manager of the Ocean Shore, with headquarters at San Francisco, Cal., to succeed Alfred Williams, deceased.

James W. Lusk, of St. Paul, Minn., has been appointed a receiver of the St. Louis & San Francisco, succeeding Thomas H. West, resigned. W. C. Nixon and W. B. Biddle, receivers, have resigned as president and vice-president respectively and as directors.

Operating Officers.

C. F. Kirchner has been appointed assistant superintendent of the Southeastern division of the St. Louis & San Francisco, with headquarters at Birmingham, Ala.

B. F. Van Vliet, division superintendent of the Chicago, Milwaukee & St. Paul at Marion, Iowa, has been appointed superintendent of the Iowa & Dakota division, at Mason City, Iowa, succeeding W. W. Collins, retired.

E. A. Goeldner has been appointed assistant to the general manager of the Atchison, Topeka & Santa Fe, Western Lines; assistant to the vice-president and general manager of the Southern Kansas Railway Company of Texas and the Pecos & Northern Texas; and assistant to the vice-president of the St. Louis, Rocky Mountain & Pacific, with office at Amarillo, Tex.

J. L. DeForce, superintendent of the Pasco division of the Northern Pacific, has been appointed superintendent of the Idaho division, with headquarters at Spokane, Wash., succeeding A. M. Burt, promoted. T. E. Coyle, assistant superintendent of the Tacoma division, has been appointed superintendent of the Pasco division, with headquarters at Pasco, Wash., succeeding Mr. DeForce. Effective January 1.

E. H. Zeigler, superintendent of terminals of the Cleveland, Cincinnati, Chicago & St. Louis at Cincinnati, has been appointed superintendent of the Peoria & Eastern division at Indianapolis, Ind., succeeding B. C. Byers, transferred. J. A. Morris succeeds Mr. Zeigler and William H. Carter has been appointed trainmaster at Springfield, O., to succeed Mr. Morris. E. M. Kelly, chief despatcher, succeeds Mr. Carter as trainmaster at Bellefontaine, O.

Traffic Officers.

J. L. Moore has been appointed general agent, passenger department, of the Northern Pacific at Kansas City, Mo.

J. J. MacEwen has been appointed traveling freight agent of the Western Maryland, with headquarters at Columbus, Ohio.

L. N. Simms has been appointed traveling passenger agent of the Louisville & Nashville, with headquarters at Birmingham, Ala.

E. C. Hoag, division freight agent of the St. Louis & San Francisco at Joplin, Mo., has been appointed supervisor of farm marketing.

William Henderson has been appointed traveling freight agent of the Hawkinsville & Florida Southern, with headquarters at Camilla, Ga.

A. G. Morris has been appointed division freight agent of the Sunset Central lines at Galveston, Tex., succeeding W. R. Smith, resigned.

C. L. Bullard, local freight agent of the Delaware, Lackawanna & Western at Utica, N. Y., has been promoted to commercial agent, with headquarters at Utica.

C. Dallas Douglas, soliciting agent of the Baltimore & Ohio at Columbus, Ohio, has been promoted to traveling freight agent, with headquarters at Columbus, succeeding C. B. Spies, advanced in the service. Harry S. Brown succeeds Mr. Douglas as soliciting agent in Columbus.

U. G. Couffer, chief of tariff bureau of the Pittsburgh, Cincinnati, Chicago & St. Louis, at Pittsburgh, Pa., has been appointed freight claim agent. E. E. Wright, freight claim agent at Pittsburgh, has been appointed assistant freight claim agent, and R. H. Smith has been appointed chief of tariff bureau.

F. C. Baird, general freight agent of the Bessemer & Lake Erie at Pittsburgh, Pa., has been appointed freight traffic manager, with headquarters at Pittsburgh. J. V. Styers, assistant general freight agent at Pittsburgh, succeeds Mr. Baird, and H. L. Baird has been appointed assistant general freight agent, succeeding Mr. Styers.

R. C. Fyfe, who has been appointed chairman of the reorganized Western Classification Committee, with office at Chicago, was born at Kilbourne, Scotland, in 1871. He received a public school education at St. Louis, Mo., and began railway work with the Missouri Pacific as a messenger in October, 1888. He went with the St. Louis Southwestern in August of the following year, and was in the service of that road continuously until January, 1912. He was mailing clerk and in various clerical positions in the general freight office at St. Louis until September, 1898, when he was transferred to Tyler, Tex., as chief rate clerk in the general freight department. On April 1, 1901, he was made chief clerk in the same department, and in December of that year was promoted to assistant general freight agent at Tyler. He retained this position until September 15, 1908, and from September, 1905, was also assistant general passenger agent. He was a member of the Committee on Uniform Classification from September, 1908, until January, 1912, when he was elected chairman of the Western Classification Committee at Chicago, and he has now been made chairman of the reorganized Committee. (See item in Traffic News.)

R. C. Fyfe.

Harry Charles Bush, formerly traffic manager of the Colorado Midland at Denver, Colo., has been appointed a member of the reorganized Western Classification Committee, with headquarters at Chicago. Mr. Bush was born at Erie, Pa., and received a public school education. In June, 1871, he began railway work with the Empire Fast Freight Line. From June, 1880, to March, 1885, he was consecutively bill clerk of the Lake Shore & Michigan Southern at Erie; stenographer with the Empire Fast Freight Line at Cleveland, Ohio; agent of the Denver & Rio Grande at Manitou, Colo.; stenographer with the Trans-Continental Association at San Francisco, and stenographer with the Atlantic & Pacific Fast Freight Line. He was contracting freight agent of the Atlantic & Pacific Fast Freight Line from March to September, 1885, and was then agent of the same line until August, 1895, when he was promoted to general freight agent of the Atlantic & Pacific. For two years from 1897 he was assistant general freight and passenger agent for the receiver of the same road, and from the latter year until July 31, 1900, was general agent in the freight department. He was then for three months general agent of the Colorado Midland at San Francisco, and from November 1, 1900, until May, 1913, he was traffic manager of that road at Denver, Colo. Since the latter date he has been traffic manager of the Idaho & Washington Northern at Spokane, Wash.

H. C. Bush.

James C. Anderson, traffic manager of the New York, Ontario & Western, at New York, having resigned, the duties of traffic manager have been assumed by J. B. Stewart, general freight and passenger agent, at New York. G. L. Robinson, chief clerk in the traffic department, has been appointed assistant general passenger agent, with headquarters at New York.

T. D. Mullaly, freight soliciting agent of the Southern Railway at Tampa, Fla., has been appointed commercial agent, with headquarters at Jacksonville, Fla., succeeding H. K. Lorraine, resigned to engage in other business. J. L. Baker succeeds Mr. Mullaly, and F. E. Harrison, Jr., has been appointed commercial agent, with headquarters at Charleston, S. C., succeeding L. M. Ansley resigned to engage in other business.

W. E. Prendergast, general freight agent of the Chicago, Milwaukee & St. Paul, at Chicago, has been appointed a member of the reorganized Western Classification Committee, with headquarters at Chicago. Mr. Prendergast was born on June 5, 1869, and began railway work in 1884 as office boy to D T. McCabe, then the general western agent for the Pittsburgh, Cincinnati, Chicago & St. Louis, at Chicago. He then became secretary to Marcus Daley, of the Anaconda Copper Mining Company, at Anaconda, Mont., remaining in that position for two years. He returned to Chicago in 1895, as a clerk to the assistant general freight agent of the Chicago, Milwaukee & St. Paul, and was subsequently chief clerk to the general freight agent. In 1907 he was appointed assistant general freight agent, and on May 1, 1913, was made general freight agent of the same road.

W. E. Prendergast.

James C. Anderson, traffic manager of the New York, Ontario & Western, at New York, has resigned. President Kerr in announcing this resignation says that: "Mr. Anderson has most ably and faithfully served this company for more than thirty years. He determined some months ago to retire from active business, but at the earnest request of the management deferred his resignation until this time. It is now accepted, upon his insistence, and with great regret." He was born on August 3, 1855, at Newton, N. J., and graduated from Rensselaer Polytechnic Institute at Troy, N. Y., in June, 1876, as a civil engineer. He began railway work the same year as transitman on an engineering corps of the Sussex Railroad, now a part of the Delaware, Lackawanna & Western. From April, 1879, to March, 1881, he was general freight and passenger agent of the Midland of New Jersey, now a part of the New York, Susquehanna & Western. He entered the service of the New York, Ontario & Western in March, 1881, as general freight and passenger agent, and in October, 1904, was promoted to traffic manager. He was also vice-president of the Morris County Railroad, now the Wharton & Northern, from January 1, 1889, to July 1, 1891.

Engineering and Rolling Stock Officers.

F. E. Bates, recently assistant engineer of the Chicago, Milwaukee & St. Paul, has been appointed chief draftsman of the bridge department of the Missouri Pacific, at St. Louis, Mo.

J. W. Sasser, master mechanic of the Seaboard Air Line at Jacksonville, Fla., has been appointed superintendent of motive

power of the Norfolk Southern, with headquarters at Norfolk, Va.

A. M. Burt, division superintendent of the Northern Pacific at Spokane, Wash., has been appointed chief engineer maintenance of way, with headquarters at St. Paul, Minn., succeeding W. C. Smith, deceased, effective January 1.

W. G. Coughlin, who has been appointed engineer of maintenance of way of the Pennsylvania Railroad, with headquarters at Philadelphia, Pa., as has been announced in these columns, was born in 1862 at Florence, N. J. He began railway work in 1878 as a rodman on the Madera & Mamore Railway in Brazil, S. A., and returned to the United States the following year. He entered the service of the Pennsylvania Railroad in 1879, in the construction department, and from March, 1883, to May, 1886, was assistant supervisor on the Northern Central, and then to March, 1893, was supervisor of the West Jersey & Seashore, becoming assistant engineer of the Baltimore division of the Northern Central in March, 1893, with headquarters at Baltimore, Md. From July, 1900, to June, 1903, he was principal assistant engineer, and then to April, 1907, was superintendent of the Elmira and Canandaigua division of the same road at Elmira, N. Y. He was appointed superintendent of the Renovo division of the Pennsylvania Railroad in April, 1907, with headquarters at Renovo, Pa., which position he held at the time of his recent appointment as engineer of maintenance of way of the same road, as above noted.

W. G. Coughlin.

G. Clinton Gardner, Jr., general foreman of motive power on the Manhattan division of the Pennsylvania Railroad at New York, has been appointed assistant engineer of motive power on the Northern division, with headquarters at Buffalo. He began railway work on February 2, 1893, on the Middle division of the Norfolk & Western as inspector at the Roanoke, (Va.) machine shop. In May, 1894, he went to the Philadelphia & Erie division of the Pennsylvania Railroad as an apprentice at the Renovo, (Pa.) machine shop and subsequently was an apprentice at the Altoona shops. After completing his apprenticeship he was made material inspector and later was assigned to special work. On March 25, 1899, he was promoted to motive power inspector at the West Philadelphia shops, and about two years later was transferred to Jersey City, N. J., as motive power inspector in the office of the superintendent of motive power. In December, 1902, he was made assistant road foreman of engines on the New York division, with headquarters at Jersey City, and in April, 1905, was made assistant master mechanic at Trenton, becoming general foreman on the Belvidere division, now a part of the Trenton division, in December, 1906. In February, 1909, he was made general foreman of motive power on the Hudson division, and three years later became general foreman of motive power on the Manhattan division, in charge of enginemen, firemen, and shops, with headquarters at New York City, which position he held at the time of his recent appointment as assistant engineer of motive power on the Northern division of the same road, as above noted.

G. C. Gardner, Jr.

J. F. Deimling, engineer of construction of the Michigan Central at Detroit, Mich., has been appointed assistant chief engineer, succeeding A. L. Sarvey, assigned to other duties. C. C. Hill, division engineer, at Niles, Mich., succeeds Mr. Deimling, and F. B. Marble has been appointed division engineer at Niles, succeeding Mr. Hill.

E. M. Keough, roadmaster of the Chicago, Burlington & Quincy, in charge of main line, at Aurora, Ill., has been appointed roadmaster and assistant trainmaster of the Streator branches, with headquarters at Aurora. R. C. Violett, roadmaster of the Savanna lines at Rochelle, Ill., succeeds Mr. Keough; and George Murphy, roadmaster at Burlington, Iowa, succeeds Mr. Violett. H. R. Clark, roadmaster of the Streator branches at Aurora, has been transferred to Burlington, succeeding Mr. Murphy.

C. A. Paquette, assistant chief engineer of the Cleveland, Cincinnati, Chicago & St. Louis and the Peoria & Eastern, has been appointed chief engineer maintenance of way, with headquarters at Cincinnati, O., and the office of assistant chief engineer is abolished. This is in connection with a change from the divisional organization to a departmental organization. Mr. Paquette will have charge of all matters pertaining to maintenance, reporting to the general manager, and engineers maintenance of way will report to him directly on maintenance matters.

Purchasing Officers.

W. H. Williams has been appointed storekeeper of the Baltimore & Ohio, with headquarters at Ivorydale, Cincinnati, O., succeeding F. A. Murphy, who becomes traveling storekeeper, with headquarters at Baltimore, Md., and J. R. Orndorff has been appointed assistant storekeeper at the Mount Clare shops, Baltimore.

OBITUARY.

Dwight A. Jones, president of the Mississippi River & Bonne Terre, with headquarters at New York, died on December 7 at St. Louis, Mo., at the age of 59.

Henry Martin, vice-president and general manager of the International & Great Northern, with headquarters at Houston, Tex., was drowned at Valley Junction, Tex., on December 5, while directing the road's relief forces in the work of rescuing persons who had been marooned by the floods in the Brazos river. He was attempting to navigate a small boat alone when the craft upset.

NEW RAILROAD OPENING UP GERMAN EAST AFRICA.—An event of great economic importance will be realized early in 1914 by completion of the Central Railway in German East Africa. Construction was begun in 1904 and completed to Tabora, 530 miles from the seaboard terminal, in February, 1912. The railroad when completed will extend 786 miles—from Daressalam, on the Indian ocean, to Kigoma, on Lake Taganyika. The line divides the German colony into two equal areas, thus making a trunk system from which branches may be built over a great part of the colony. A vast and productive region is thus opened for establishing plantations. It will also become the outlet for the broad hinterland in which lies Lake Tanganyika, with its 400-mile stretch of navigable waters, tributary to which is a rich commercial region in the heart of Africa. Along the extensive shore of this lake products will be gathered and distributed by a fleet of ships co-operating with the railway. German East Africa, with its area of 384,000 square miles and population of 10,000,000, is certain to respond to the economic advantages created by the completion of the Central Railway. Great areas of wild land will be brought into modern cultivation, in which large capital will be invested, new mineral regions and forest areas will be exploited and public highways will be extended.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Missouri Pacific has ordered 25 mikado locomotives from the Baldwin Locomotive Works.

The Bethlehem Chile Iron Mines Company, So. Bethlehem, Pa., has ordered two industrial locomotives of the 0-6-0 type from the American Locomotive Company for use in Chile. They will have 19 x 24 in. cylinders, and 46 in. driving wheels; their total weight in working order will be 123,000 lb., and the steam pressure 180 lb.

CAR BUILDING.

The Grand Trunk is in the market for 500 flat, and 500 stock cars.

The Grand Trunk is also said to be in the market for 110 passenger cars. This item has not been confirmed.

The New Jersey, Indiana & Illinois is in the market for 100 freight cars.

The Carolina, Clinchfield & Ohio has ordered 300 stock cars of the Pressed Steel Car Company.

The Lehigh Valley has ordered 1,000 50-ton steel coal cars from the Standard Steel Car Company.

The Salt Lake & Utah, Salt Lake City, Utah, has ordered 3 motor cars from the Hall Scott Motor Car Company.

The Toledo, St. Louis & Western is negotiating with the Haskell & Barker Car Company for the purchase of 1,000 40-ton box cars.

The Pacific Great Eastern, 404 Welton building, Vancouver, B. C., has ordered 2 motor cars from the Hall Scott Motor Car Company.

The Alabama, Tennessee & Northern is said to be in the market for 300 box, 125 gondola and 75 flat cars. This item has not been confirmed.

The Chesapeake & Ohio reported in the *Railway Age Gazette* of November 21 as being in the market for 2,000 coal cars is now in the market for 1,000 70-ton hopper cars and 1,000 steel underframe box cars.

IRON AND STEEL.

The Southern Pacific has ordered 28,000 tons of open-hearth rails from the Tennessee Coal, Iron & Railroad Company.

The Chicago & Illinois Western is in the market for two bridges, a single-span leaf bridge with a 200 ft. span and a through span girder.

SIGNALING.

The plans of the Lehigh Valley for the year 1914 include the installation of automatic block signals on about 75 miles of line; Van Etten Junction to Geneva Junction, 58 miles, single track, and one mile, double track; Rochester to Honeoye Falls, 17 miles, single track. Power interlocking is to be installed at South Wilkesbarre, with a machine of 68 levers.

The Southern Pacific Company plans to extend automatic block signals on the Pacific system during the coming year about 47 miles; single track, 31 miles, double 16 miles. The plans provide also for electric interlocking machines, General Railway Signal Company's model 2, at Davis, Cal., 80 levers; Palisade, Nev., 36 levers, and Elftman, Cal., 32 levers. Mechanical interlockings are to be put in at Flanigan, Nev., 16 levers, and Eugene, Ore., 12 levers.

Supply Trade News.

The Detroit Seamless Tubes Company, Detroit, Mich., is now having a new tube rolling mill built under the charge of R. C. Stiefel, of Ellwood City, Pa.

W. J. McKone, for many years traffic manager of the Jacob Dold Packing Company, has been appointed general sales agent of the Metal Car Seal Company, Chicago.

Robert W. Hunt & Co., have begun the publication of a magazine called the *Employees' Bulletin* for members of the organization, made up of material contributed by employees in the form of articles regarding their daily experiences and news items regarding work under construction on which the company's inspectors are engaged.

T. N. Jacob, of East St. Louis, Ill., the chief engineer of the East Side Levee and Sanitary District of that city, from its organization, has resigned to engage in private practice. He may be consulted on levee and drainage projects, railroads, mines and municipal engineering. His office is room 300, Cahokia building, East St. Louis, Ill.

Charles W. Allen, manager of the railway department of the Reading-Bayonne Steel Casting Company, Reading, Pa., has been made vice-president and a director of the Reading Specialty Company, a company recently organized to sell the cast steel products of the Reading-Bayonne Steel Casting Company. Mr. Allen received his education in the Tamaqua (Pa.) schools and served as a machinist's apprentice in the Tamaqua shops of the Philadelphia & Reading. He later became engine house foreman at Milton, where he remained for six years. In 1904 he was transferred to Reading as master mechanic of the Reading & Harrisburg division. He left this position on January 1, 1907, to become railroad representative of the L. S. Bordo Company, with which he remained until his appointment as manager of the railway department of the Reading-Bayonne Steel Casting Company. He is the son of G. S. Allen, one of the oldest members of the Master Mechanics' Association, who was formerly a master mechanic of the Philadelphia & Reading, and who served that road for 54 years.

C. W. Allen.

J. W. Hibbard, for many years treasurer of the Grip Nut Company, with office at 500 Fifth avenue, New York, retired from the business of that company on November 1 and is taking advantage of this opportunity to take a much-needed rest and will spend a year or two in travel in an endeavor to improve his health. Mr. Hibbard has a host of friends among railway and supply men.

The list of the various awards made at the International Building Exposition, held at Leipzig, Germany, during the past summer, has been received. Among those who were awarded the gold medal of the exposition and the various silver medals, bronze medals, and diplomas are several American firms, including three engineering organizations and an individual engineer. The Alsace Lorraine prize was awarded to the Board of Water Supply of New York, while Gustav Lindenthal, the American Bridge Company, and the Strauss Bascule Bridge Company of Chicago were awarded the gold medal of the city of Leipzig. Mr. Lindenthal, in connection with the American Bridge Company, exhibited plans of the Hellgate bridge, etc.,

while the Strauss company had a small exhibit of models and photographs of Strauss bascule and lift bridges.

Edgar H. Watlington has accepted the office of eastern sales agent for the Elwell-Parker Electric Company, 50 Church street, New York, with Lucian C. and George W. Brown, who continue as general sales agents of the company. Mr. Watlington was born in Hackensack, N. J., January 18, 1870. He graduated from the high school and was engaged in business for three years before taking up the students' course in 1890 at the Schenectady works of what was then the Edison General Electric Company. On completing this course he took the position of tester in the testing department of the Crocker-Wheeler Electric Company. Remaining with this company six months, he then became superintendent of the Ridgewood Electric Light & Power Company, Ridgewood, N. J. After a service of three years he became a salesman of electrical apparatus with the Sprague Electric Company, New York. Mr. Watlington remained with that company for sixteen years during which time it was absorbed by the General Electric Company. He was active in the development of the electric hoist and was sales manager of that department for ten years. He was then made manager of the newly created freight handling machinery department which had charge of overhead hoisting and conveying machinery and electric freight handling trucks.

Frank A. Purdy, who for seven years has been manager of the Canadian Gold Car Heating & Lighting Company at Montreal, has been transferred to the New York office of the Gold Car Heating & Lighting Company. He will bear the title of sales manager for the Canadian company and also for the Gold Car Heating & Lighting Company in the United States, with headquarters in New York City. The W. W. Butler Company, Ltd., of Montreal, will act as selling agents for the Canadian Gold Car Heating & Lighting Company. Mr. Purdy was born in the central part of New York State in 1866. His family moved to Iowa in 1868. He began railroad work in 1887 as fireman on the Burlington, Cedar Rapids & Northern, now part of the Rock Island system, where he remained until 1892, when he went to Chicago to engage in the livestock commission business. In 1905 he joined the staff of the Gold Car Heating & Lighting Company. For about two years he did general field work on the selling force, subsequently being appointed to manage the Canadian company.

F. A. Purdy.

TRADE PUBLICATIONS.

TELEPHONE SELECTORS.—The General Railway Signal Company, Rochester, N. Y., has issued an attractive booklet illustrating the G. R. S. telephone selector.

HEAVY PATTERN LATHES.—Manning, Maxwell & Moore, Inc., New York City, general sales agents for the Putnam Machine Company of Fitchburg, Mass., have issued an attractively illustrated folder describing the heavy pattern, 42-in. coach and truck wheel lathe manufactured by that company.

STORAGE BATTERY LOCOMOTIVES.—The General Electric Company, Schenectady, N. Y., has recently issued bulletin A4131, describing its storage battery locomotives and outlining the general conditions under which the use of such locomotives is desirable or advantageous. The bulletin illustrates and describes various designs and sizes which have been built and placed in service.

Railway Construction.

CENTRAL NEW ENGLAND.—An officer writes that second-track work is now under way on 2.3 miles from Highland, N. Y., to Loyd. The O'Brien Construction Company, New York City, has the contract.

DOMINION ATLANTIC.—An officer writes that a contract has been given to Kirk & Cooke, North Sidney, N. S., to build from Centreville, N. S., to Weston, 14.79 miles. In addition the company has projected a new line from Sissiboo Falls, N. S., to Weymouth, 8.5 miles.

GRAND RAPIDS & NORTHWESTERN.—An officer writes that a contract has been given to the W. S. Syrett Construction Company, Chicago, to build a section of this line between Grand Rapids, Mich., and Ludington, and that all contracts are now let to build the entire line, 98 miles. The company proposes to operate car ferries between Ludington and Manitowoc, Wis., and Milwaukee. There will be one bridge over the Muskegon river. J. N. Tittemore, president, Milwaukee, Wis., and T. R. Philbin, chief engineer, Ludington, Mich. (November 28, p. 1048.)

KANSAS CITY TERMINAL.—An officer of this company, which operates a terminal road at Kansas City, Mo., and at Kansas City, Kan., writes that the company is building a double-track extension from Southwest Boulevard to St. Louis avenue, two miles. In addition plans have been made to lay three miles of third and fourth tracks from Prospect avenue to Sheffield, and 0.75 miles of third and fourth tracks from Frisco Crossing to Broadway.

MONTREAL & LAKE VICTORIA.—The company is applying to the Canadian parliament for an extension of time to build from Montreal, Que., northerly or northwesterly through Hochelaga, Maisonneuve, Laval, Terrebonne, Two Mountains, Argebteuil, Montcalm, Labelle, Wright or Pontiac counties, Quebec, to a connection with the National Transcontinental near mileage 840 west of Moncton, N. B., and thence to James Bay, near Hannah Bay, Ont. F. L. Wanklyn, Canadian Pacific; Hon. N. Curry, Canadian Car & Foundry Company, and E. Rodier, all of Montreal, are said to be interested.

NEW YORK, NEW HAVEN & HARTFORD.—An officer writes that surveys are being made for third and fourth tracks on the following sections: From Woodlawn Junction, N. Y., to South Mt. Vernon, 1.53 miles, and from Atlantic, Mass., to South Braintree, 5.90 miles; between Hebronville, Mass., and Readville Transfer, 23.25 miles of third track and 22.75 miles of fourth track; between Weir Junction, Mass., and Whittenton Junction, 2.10 miles of third track and 2.23 miles of fourth track.

NEW YORK SUBWAYS.—The New York Public Service Commission, First district, has awarded contracts for the construction of three sections of the subways as follows: Section No. 1-A of Routes Nos. 19 and 22, the Southern boulevard branch of the Lexington avenue subway, in the borough of the Bronx, from One Hundred and Forty-seventh street under Southern boulevard to Whitlock avenue, to Rodgers & Hagerty, the lowest bidder, for $2,253,159. This section will be a three-track underground railroad. Section No. 1 of Route No. 16, the Jerome avenue branch of the Lexington avenue subway, from One Hundred and Fifty-seventh street and River avenue through River and Jerome avenues to about One Hundred and Eighty-second street, to the Oscar Daniels Company, the lowest bidder, for $1,077,978. This section will be a three-track elevated railroad. Section No. 2 of Route No. 18, the White Plains Road extension of the existing subway, from Burke avenue through White Plains road to East Two Hundred and Forty-first street, to Alfred P. Roth, the lowest bidder, for $958,484. This section will be a three-track elevated railroad. The commission has also opened bids for the construction of Section No. 2 of Routes Nos. 4 and 38, the Seventh avenue extension of the existing subway. This section is to be a four-track underground railroad under Greenwich street, West Broadway and Varick street, between Vesey street and Beach street, including a two-track branch turning from West Broadway into Park Place. Bids for

this section were opened on October 1, but the commission rejected all the bids and readvertised. The Degnon Contracting Company was the lowest bidder on the second letting, at $3,059,522. The contract for this section will probably be let this week. Plans for Section No. 6 of Routes Nos. 4 and 38, the Seventh avenue subway, were approved and the commission has called for bids, to be opened December 29. This section lies in Seventh avenue between Thirtieth and Forty-third streets, and will include the express stations at Thirty-fourth street (Pennsylvania Terminal) and at Forty-second street (Times Square).

The New York Public Service Commission, First district, has awarded the contract for the construction of Section No. 2 of Route No. 39, the elevated railroad in New Utrecht avenue, in the borough of Brooklyn, to Post & McCord, Incorporated, the lowest bidder, for $1,672,190. This line will connect with the Fourth avenue subway, and over it Coney Island traffic will reach Manhattan. It is to be operated by the New York Municipal Railway Corporation. Construction work must begin within 60 days after the delivery of the contract, which has not yet been executed.

The commission has required the New York Municipal Railway Corporation to submit to public bidding the contract for the construction of Section No. 2 of the elevated line extension of the Myrtle avenue elevated line to Lutheran Cemetery. This section covers that portion of the Lutheran Cemetery line between Fresh Pond road and Metropolitan avenue. The plans call for a double-track elevated structure about 1,050 ft. long and an approach of about 315 ft., the approach to consist of concrete retaining walls and earth fill.

Oregon Short Line.—An officer writes that grading work has been completed on the extension from Donnelly, Idaho, north to Lakeport, 11.72 miles, and second track work is now under way from Dingle, Idaho, to Pescadero, 12.73 miles. In addition the company plans to lay second track from Fossil, Wyo., to Dingle, Idaho, 56.67 miles; also from Pescadero, Idaho, to Lava, 56.70 miles.

All the grading work has been completed on the Salt Lake & Idaho building from Marshfield, Idaho, south to Strevell, 50.08 miles.

Rome & Northern.—An officer of this company, which operates a line from Rome, Ga., north to Gore, 18.7 miles, writes that an extension has been projected from Gore, Ga., north to Subligna, eight miles.

Salt Lake & Idaho.—See Oregon Short Line.

San Pedro, Los Angeles & Salt Lake.—This company has location made for a main line between Ontario, Cal., and Otis, but has not yet decided to build such a line. The company now operates over its own tracks from Ontario to Riverside, then over the Southern Pacific from Riverside to Colton, four miles, the Atchison, Topeka & Santa Fe, from Colton to Daggett, 96 miles, and then over its own rails again from Daggett to Otis, four miles.

RAILWAY STRUCTURES.

Baltimore, Md.—The Baltimore & Ohio has completed work on a steel and concrete bridge, 1,530 ft. long, which carries Ostend street over the B. & O. tracks, and turned it over recently to the city authorities with fitting ceremonies. This improvement is part of a program of grade crossing elimination within the city of Baltimore, now being carried out by the railroad company with the co-operation of the city. The plans call for the elevation of five city streets to be carried over the tracks in the Camden terminal. It is expected that the bridge at Hamburg street will be open to the public soon. Under a city ordinance, Ostend, Hamburg, Cross and Lee streets are to be elevated. The agreement calls for the completion of one each year until the work is finished.

Monroe, La.—The Vicksburg, Shreveport & Pacific has started work on additions and improvements to its shops at this point.

Scranton, Pa.—An officer of the Central of New Jersey writes that a brick station is to be built at Scranton, to cost about $60,000.

Railway Financial News.

Bennettsville & Cheraw.—This road has been leased to W. R. Bonsal for five years with an option to purchase it. Press reports say that Mr. Bonsal represents Seaboard Air Line interests. The Bennettsville & Cheraw runs from Kollocks, S. C., south to Sellers, about 42 miles.

Buffalo & Susquehanna.—The Railroad company property was sold under foreclosure on December 5 to Jacob S. Farlee and Lyman Rhodes, representing the holders of the 4 per cent. first refunding bonds, for $5,000,000.

Canadian Pacific.—The directors have set aside a trust fund from the deferred payments on land sales and securities in which the cash proceeds of land sales are invested, totaling $55,000,000, and stockholders are offered the privilege of subscribing at 80 to an issue of $52,000,000 6 per cent. note certificates, due March 2, 1924.

Chesapeake & Ohio.—The United States circuit court of appeals has set aside the judgment rendered against the company for $300,000 for breach of contract and has sent the case back to the district court for retrial, holding that the amount fixed as damages was determined on a speculative basis.

Chicago, Rock Island & Pacific.—Stockholders are to vote, January 31, on the question of leasing for 999 years the Rock Island, Stuttgart & Southern, which runs from Mesa, Ark., south to Stuttgart, 22 miles.

Delaware, Lackawanna & Western.—This company has called for payment on January 5 the $6,000,000 balance due on the stock authorized in February, 1913. The first payment of 50 per cent. was made in February.

Lehigh Valley.—The report that Drexel & Co., of Philadelphia, have agreed to take $10,000,000 general consolidated mortgage 4½ per cent. bonds is denied. Vice-President L. D. Smith says:

"Negotiations have not been in progress, much less consummated. The report that the company desires to finance itself before the new public utilities law becomes effective in Pennsylvania, on January 1, is entirely baseless.

"It is very likely that Lehigh Valley will do some financing before the close of the current fiscal year, perhaps in the early spring in order to provide cash for capital improvements. We have bought large amounts of equipment, especially steel passenger cars, and made other expenditures of a capital nature, and as we have not done any financing since 1910, it is not unlikely that we shall enter the money market in the near future. We have not, however, as yet sold any bonds nor are we negotiating for the sale of any."

Rock Island, Stuttgart & Southern.—See Chicago, Rock Island & Pacific.

St. Louis & San Francisco.—Thomas H. West has resigned as receiver, and has been succeeded by J. W. Lusk. The other receivers are W. C. Nixon and W. B. Biddle.

W. C. Nixon and W. B. Biddle, receivers, have resigned their positions as president and vice-president respectively, of the company, and retire from the board of directors. On Tuesday of this week Judge Sanborn, of the Federal court, granted the petition of William Niles, of New York, a stockholder, for leave to bring suit against the officers of the road for restitution in the matter of the profits of $3,975,000 said to have been made by individual officers in the sale of a number of subsidiary lines to the St. Louis & San Francisco.

The receivers have also filed a petition in the courts for permission to begin a suit against former directors and officers for restitution, the application being based on the doings of the syndicate that sold the St. Louis, Brownsville & Mexico to the St. Louis & San Francisco.

Western Railway of Alabama.—A semi-annual dividend of 3 per cent. has been declared on the $3,000,000 stock, payable January 2, thus raising the annual rate from 5 per cent., paid since 1907, to 6 per cent.